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# Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

Volume 24, No. 2 • March/April 2000

## Vividness and the Media Paradox

## PHYSICS AND THE PARANORMAL

## The Efficacy of Medical Prayer

## Can We Tell If Someone Is Staring at Us?

## Assessing Medical Web Sites

## An Analysis of Reverse Speech

Published by the Committee for the Scientific Investigation of Claims of the Paranormal

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*Vividness, Availability, and the Media Paradox*

*The popular media deliver reports on a carefully chosen set of events in vivid detail. Owing to its concrete, personal, and emotional flavor, this biased sample of information is easily retrievable from memory and therefore exerts a disproportionate influence on our judgments and decisions. This results in the media paradox: The more we rely on the popular media to inform us, the more apt we are to misplace our fears.*

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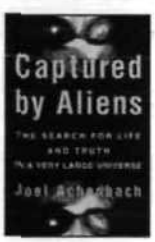


Front Cover Design by Lisa A. Hutter

## EDITOR'S NOTE

# *Don't Look to Physics for Validation of the Paranormal*

Modern twentieth century physics brought two major revolutions—relativity and quantum mechanics—that advanced wholly counterintuitive ideas about the nature of reality. Despite their seeming strangeness, these propositions have been confirmed countless times and stand as an integral part of modern science. But that very strangeness has led many people, including some popular writers, to assume that virtually anything goes—that the spooky properties of quantum mechanics, for example, provide some kind of scientific foundation for reports of premonitions, psychic experiences, extrasensory perception, and other experiential manifestations of what we call the paranormal. In this issue Gerard 't Hooft, co-recipient of the 1999 Nobel Prize in Physics, decisively deflates that idea. 't Hooft, professor of physics at the University of Utrecht, explores what he calls the "leeway and loose ends" of modern physics that lead to these suppositions. He shows how modern physics and biology so restrict the possibilities that they provide no basis for physical explanations of the paranormal. Look to ourselves instead, he says. Our thanks to our colleague Jan Willem Nienhuys for making this article possible.

* * * *

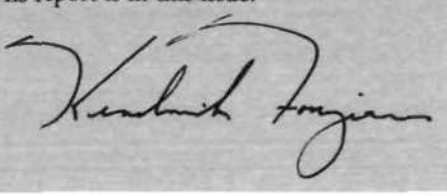
In "Risky Business: Vividness, Availability, and the Media Paradox," social psychologist John Ruscio (Elizabethtown College) explores our skewed perceptions of risk. The extent and vivid detail with which some uncommon events are reported overpowers in our consciousness mundane reports of more frequent and thus more likely dangerous events. This contributes to what he calls the media paradox: The more we rely solely on popular media to inform us, the more apt we are to misplace our fears. Ruscio examines a variety of subtle issues involving the media and our perceptions of risk.

* * * *

News reports in October brought claims of yet another published scientific study supposedly affirming the efficacy of prayer—specifically prayer when you are unaware people are praying for you. In this issue, Irwin Tessman, professor of biology at Purdue University, and Jack Tessman, professor of physics emeritus from Tufts University, critically assess the 1999 Harris et al. study as well as the earlier 1988 Byrd study that made similar claims. They find serious faults that invalidate the conclusions. One study, they say, is improperly designed, the other fallaciously analyzed—and the two contradict each other.

* * * *

The spooky feeling that someone is staring at us—it's one of the anecdotal experiences that contribute to belief in the supernatural. Recently some parapsychologists have been contending that this is more than anecdote, that people really can tell if someone is staring at them. Robert Baker, professor of psychology emeritus at the University of Kentucky, decided to carry out two demonstrations to test this claim. His report is in this issue.

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# Thought Field Therapy Practitioners and Educators Sanctioned

SCOTT O. LILIENFELD AND
JEFF M. LOHR

Until quite recently, most regulatory bodies (e.g., state licensing boards) in the field of psychology have been reluctant to encroach upon the freedom of clinicians to use their preferred therapeutic techniques. This "let a thousand flowers bloom" approach to psychotherapeutic practice has come under attack from research-oriented psychologists, many of whom contend that the increasing proliferation of unvalidated treatments poses a serious threat to clients and to the scientific status of clinical psychology.

Two surprising developments in 1999 may signal a trend toward heightened restrictions on clinicians' adoption of unsubstantiated psychotherapeutic methods. These developments concern a controversial technique known as Thought Field Therapy (TFT), which was invented in the early 1980s by Roger Callahan, a clinical psychologist and author of *The Five Minute Phobia Cure.* TFT, which is claimed by its proponents to be an extremely effective and efficient treatment for post-traumatic stress disorder, phobias, addictions, and other psychological conditions, has burgeoned in popularity among clinicians in the past several years. For example, TFT was used by clinicians to treat survivors of the 1998 bombing of the United States Embassy in Nairobi, Kenya, and TFT workshops have recently been offered in many major American cities.

TFT purportedly works by manipulating and balancing the client's energy fields by means of a complex series of algorithms or fixed procedures. While clients imagine an anxiety-provoking event or stimulus, the TFT therapist instructs them to tap various body parts (e.g., eyebrow, collarbone, knuckles) in a predetermined order using their fingers. Later, clients are asked to move their eyes in specific directions, count to five, hum snatches of a tune, and again tap various body parts in a specified order. Although there are no published controlled studies of TFT's efficacy, many of its advocates have claimed 80–95 percent success rates for a variety of psychological conditions.

The first major official challenge to TFT's legitimacy occurred in mid-1999, when the Arizona Board of Psychological Examiners sanctioned a psychologist who used TFT as his principal therapeutic modality. This clinician was placed on probation, ordered to refrain from administering TFT within the practice of psychology, and informed that he would be strictly monitored for compliance with this order. Foremost among the reasons for the board's action was the therapist's inability to substantiate his advertised claims of effectiveness.

Another reason was the therapist's use of a TFT technique known as voice technology, which involves an electronic device to convert the client's voice into a visual display. Voice technology ostensibly allows clinicians to diagnose the client's energy blocks over the telephone and then prescribe a formal course of TFT treatment without ever having to meet the client in person. The therapist disciplined by the Arizona Board had refused to disclose information concerning the voice technology device, and invoked a confidentiality agreement with Dr. Callahan regarding this device as the rationale for his refusal.

In recognition of the Arizona Board's decision, the Science and Pseudoscience Review committee, a newly formed special interest group within the Association for Advancement of Behavior Therapy (AABT), bestowed its first annual Scientific and Professional Integrity Award upon the board at the November 1999 AABT convention in Toronto.

In September 1999, the American Psychological Association (APA) Continuing Professional Education Committee ruled that the absence of any compelling scientific support for its efficacy rendered TFT an inappropriate subject for Continuing Education (CE) courses. These courses are taken on an ongoing basis by practitioners in order to fulfill licensure requirements. As a result of the decision, CE sponsors who proposed to offer courses focused primarily on TFT were informed that their applications would no longer be approved. In recent years, many scientifically oriented psychologists have sharply criticized APA for failing to set limits on the content of CE courses, which have included workshops on calligraphy therapy, Jungian sandplay therapy, and other unvalidated techniques. As a consequence, APA's actions have been hailed by a number of psychologists as a significant step toward addressing these criticisms.

The actions of the Arizona Board and APA have been met with numerous protests from TFT proponents, many of whom maintain that their method has been unfairly targeted. Indeed, a number of similarly unsubstantiated psychotherapies have largely escaped the close scrutiny of regulatory bodies. In the eyes of some observers, however, these two recent actions may herald a shift away from a laissez-faire approach to psychotherapeutic practice and toward heightened clinician accountability.

*Scott O. Lilienfeld, Ph.D., is an assistant professor of psychology at Emory University and a SKEPTICAL INQUIRER Consulting Editor. Jeffrey M. Lohr, Ph.D., is a professor of psychology at the University of Arkansas and President of the AABT Science and Pseudoscience Review Special Interest Group.*

## New York in Quarantine? Failed Psychic Predictions for 1999

Remember the 1990s? It was the decade when scientists discovered an anti-aging drug that stretched the normal lifespan to 150 years, Madonna gave birth to quintuplets, earthquakes transformed both San Diego and Los Angeles into islands, and a Super Bowl had to be canceled because so many players were suspended for drug use that both coaches couldn't field a team.

At least that's what *should* have occurred had the world's top psychics been correct. People may be celebrating the new millennium, but the world's top psychics shouldn't be raising a glass of champagne to celebrate their successes for the 1990s, according to Gene Emery, who has been tracking the hits and misses of the tabloid psychics for two decades.

And, Emery says, the folks who claim to be able to see the future also didn't do very well in their forecasts for 1999. The psychics said 1999 would be the year that:

- A pollution cloud forced New York City to be quarantined;
- Wynonna Judd quit country music to become a women's wrestler;
- Marijuana replaced petroleum as the nation's chief source of energy;
- The cast of *60 Minutes II* was replaced by Candice Bergen, Mary Tyler Moore, and Margot Kidder;
- The Statue of Liberty lost both arms in a terrorist blast;
- Monica Lewinski became a millionaire after opening a New York boutique for the full-figured women called Monica's Closet;
- O.J. Simpson confessed to Howard Stern on the air that he killed his ex-wife, and
- Roseanne shed her clothes to do a week's worth of talk shows from a nudist colony.

"It's always hard to find evidence that a psychic predicted an unexpected event *before* the fact," said Emery, a science writer in Providence, Rhode Island. For example, the forecasts published with great fanfare in the supermarket tabloids failed to mention such surprising events as the massive earthquakes in Turkey and Taiwan, the nuclear accident in Japan, or the death of John F. Kennedy Jr., his wife, and sister-in-law.

Instead, said Emery, Anthony Carr, billed as "the world's most documented psychic" by the *National Examiner*, is documented as predicting that Carolyn Bissette-Kennedy would give birth to healthy twins. And Sanjiv Mishra of India, described by the tabloid *Sun* as one of the ten "greatest psychics on Earth," made the not-so-great forecast that JFK Jr. would fly "on a space shuttle mission in August," with John Glenn as his co-pilot.

Tracking the psychics is fun, but it has a serious side, said Emery. "Every time the media hypes psychics, it encourages consumers to waste large amounts of money calling psychic hotlines. Most can ill afford it. It also encourages some police departments to listen to psychics who claim to be able to solve crimes. Not only do 'psychic detectives' waste valuable police resources, the psychics sometimes implicate people who later turn out to be innocent."

Emery said psychics give the illusion of being accurate when people forget the bad predictions or don't realize how equivocal the forecasts are. Psychic Sylvia Browne, for example, predicted that in 1999 "the Pope will become ill and could die." Said Emery: "That means she can claim success if the Pope suffers anything from a head cold to a fatal heart attack." (Browne's notable predictions for 1999 included forecasts of cures for breast cancer and sudden infant death syndrome [SIDS]. She also said that "The world will not end anytime soon.") Some of the unambiguous forecasts the psychics made for the 1990s include:

- Soviet cosmonauts will be shocked to discover an abandoned alien space station with the bodies of several extraterrestrials aboard;
- Fidel Castro will be jailed after his government is overthrown "in a massive revolt";
- The U.S. Postal Service will cancel mail delivery on Saturdays;
- Cancer will be cured;
- Oprah Winfrey will marry the next mayor of Washington, D.C.;
- Liz Taylor will marry Malcolm Forbes;
- The first successful human brain transplant will be performed;
- Public water supplies will be treated with chemicals that will prevent AIDS;
- American voters will be able to cast their ballots using touch-tone telephones; and
- Deep sea vacation dives to the *Titanic* will become commonplace.

## 'Fastest Man on Earth,' Col. John Paul Stapp, Dies at 89; Had Connections to Roswell Incident, Murphy's Law

Colonel John Paul Stapp, USAF (Ret.), died on November 13, 1999, in Alamogordo, New Mexico, at age 89. On December 10, 1954, Stapp became the "Fastest Man on Earth" in a pioneering rocket sled experiment, in which he was accelerated to 632 miles per hour in just five seconds, and then

brought to a complete halt in 1.4 seconds. The purpose of the experiment was to study the effects of bailing out from supersonic aircraft. Stapp's medical research led to innovations in seatbelts and other safety devices, although his recommendation to make seats in passenger aircraft face the rear (so the entire back can absorb the shock of a sudden stop) was not adopted.

As head of the Stapp Foundation, he led an annual conference for surgeons and engineers on car crashes, which still continues in his name. His landmark speed record earned him a place on the cover of *Time* magazine on September 12, 1955, and he was the subject of the 1956 Twentieth Century Fox movie *On the Threshold of Space.* His busy career earned him many accolades as well, including the National Medal of Technology, presented by President Bush in 1991.

His work with high-altitude balloon pioneer Col. Joseph W. Kittinger led Stapp to commission a series of lifelike human dummies for crash tests. Some of these crash-test dummies may have even been mistaken for Roswell "aliens." (See "Case Closed: Reflections on the 1997 Air Force Roswell Report," Gildenberg and Thomas, SKEPTICAL INQUIRER, March/April 1998 [Vol. 22, No. 2].)

A November 16, 1999, *New York Times* obituary by Douglas Martin included a story about an assistant to Col. Stapp, one Capt. Edward A. Murphy, Jr., who had incorrectly installed some sensors used on Stapp in a 1949 high-speed sled ride. The sensors could be installed in one of two ways, and Murphy managed to place every single sensor in the wrong position. And so it was that Col. Stapp, staggering off of the sled with blood oozing from his eyes, learned that the sensors all read "zero"—he had been tortured for nothing. Capt. Murphy remarked, "If there are two or more ways to do something and one of those results in a catastrophe, then someone will do it that way," the original statement of the well-known Murphy's Law, "If Something Can Go Wrong, It Will Go Wrong (at the worst possible time)."

Col. Stapp wrote the following words, which he intended to serve as his epitaph:

When life comes to a crossing of the ways
Where mere existence falters through its path
While sands of time drain to the aftermath,
What morning through review my former days
How hard I worked to make my life worthwhile
The causes lost before they could be won
The goals not reached, tasks started but not done
The day of waiting for good fortunes smile.

Forever free from life's unending woes,
Through endless tranquil ages I'll repose.
No more to grope for goals I could not gain
No more to feel the bitterness of pain,
Forever free from life's unending woes,
Through endless tranquil ages I'll repose.

From "For Your Moments of Inertia: From Levity to Gravity," Copyright 1992 by John Paul Stapp.

*—David E. Thomas*

*Dave Thomas is a New Mexico physicist and SKEPTICAL INQUIRER consulting editor.*

## Fortunetelling Ban Lifted in Louisiana

In November 1999, a federal judge in New Iberia, Louisiana, struck down that city's 1982 ban on palm reading and fortunetelling. Judge Tucker L. Melancon ruled that the town had violated its residents' First Amendment rights. Lawyers for New Iberia argued that the ban protected the welfare of its 32,000 citizens by cracking down on fraud and unfair trade practices. Framing the fight as a free speech issue, Melissa Long, a fortuneteller, joined psychic reader Ray Trimble and the American Civil Liberties Union in suing the city over the closure of Trimble's shop. After the ruling Long commented that the decision was a "victory for free speech" that "brings New Iberia up to the times."

*—Benjamin Radford*

*Benjamin Radford is Managing Editor of the SKEPTICAL INQUIRER.*

## Geller Rebottled

He's ba-a-a-ck. "Psychic" Uri Geller debuted for a new generation of TV viewers on January 5, 2000, when he appeared on *The Tonight Show with Jay Leno*. The Israeli entertainer has had other, short-lived comebacks since he burst on the scene in 1973, convincing media personalities and even some scientists that he had special powers of telepathy and psychokinesis, especially using his brainwaves to bend metal objects such as keys and spoons.

At one time or another Geller has claimed to locate gold and oil by map dowsing, to perform an eyeless-vision demonstration with an automobile (a feat magicians call "the blindfold drive"), even to be in contact with super-beings from a distant planet.

Over the years Geller has launched numerous lawsuits, one a $15 million action against CSICOP and James Randi. CSICOP maintained the suit lacked merit and was intended to harass critics and silence debate. The court's judgment was to brand Geller's complaint "frivolous" and to award CSICOP sanctions against him (covering a portion of CSICOP's considerable legal fees). Geller has launched other suits against Randi and his publisher, Prometheus Books, as well as others outside the skeptical community.

In introducing Geller, Jay Leno appeared somewhat embarrassed, and distanced himself by stating that he was neither a skeptic nor "naive." The talkative "psychic," boasting of his self-claimed prowess, told a story about one television viewer who had blamed him for her pregnancy: Supposedly his broadcast metal-bending power had distorted her IUD. Geller seemed anxious to exhibit the contraceptive device, mentioning that it was in his pocket, but Leno discouraged him while wondering aloud how Geller might have gotten it.

Geller proceeded to perform. He noted that actor Tim Robbins, seated beside him, had earlier made a drawing, witnessed by others and sealed in an envelope in Robbins's pocket. Geller asked the actor to project his thoughts.

The entertainer then began drawing a spiral and adding a few more strokes. He claimed not to know what the sketch meant, but when the target drawing was produced his rendering was a good match with Robbins's pictorial of a snail.

As if divining the thoughts of skeptics everywhere, the wonderworker hastily acknowledged that magicians could produce the same effect, while insisting his performance was "kosher." Indeed, magic catalogs and conjuring textbooks reveal many ways of divining someone's supposedly secret sketch, a "psychic magic" feat called "Telepathic Drawing." Apparently Geller wants his audience to assume that what looks just like a magic trick is not, if the performer casually says it is not.

Interestingly, Geller did not perform his classic feat of bending a key or spoon in a spectator's hand—an effect magicians accomplish by trickery. (A magician's catalog even sells a book on metal-bending tricks with "keys and silverware.")

Geller did perform another old favorite. Exhibiting a tray of supposedly "broken" watches, Geller placed a few of these between his palms while encouraging viewers at home to do likewise—even to place a spoon atop the television! Soon Geller had Leno verify that a watch was ticking, and he invited viewers to call in with their own anticipated successes.

Actually, remote "psychokinesis" is simplicity itself. Watches may start running again when they are handled; previously unnoticed bends in spoons or keys may be revealed—or imagined—on inspection; an unrelated occurrence (such as an appliance malfunction) may be attributed to the alleged psychic stimulus; and false claims may be made, either out of the respondent's desire to promote mystical beliefs or a need for attention. Magicians like Milbourne Christopher discovered that the metal-bending stunt worked as well for skeptics as it did for the reputed marvel.

If Geller is not—as he insists—doing magic tricks, he is being underappreciated, since his effects are indistinguishable from those accomplished by magicians with more verve and entertainment. His *Tonight Show* appearance promoted his new book, *Mind Medicine: The Power of Positive Healing.* It thus appears that Geller has climbed aboard yet another dubious bandwagon.

*— Joe Nickell*

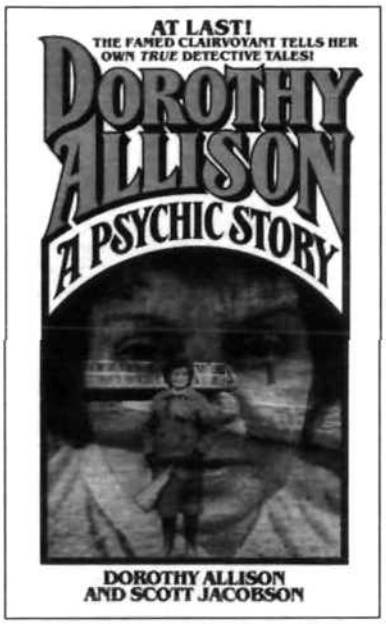
*Joe Nickell is CSICOP's Senior Research Fellow.*

## Manslaughter Charges for Herbalist, Spiritualists

Lawrence Perry, an alternative medicine practitioner in North Carolina, has been charged with manslaughter in the death of an eight-year-old girl under his care. Helena Rose Kolitwenzew, a diabetic, died on October 21, 1999, after her mother Marion stopped administering insulin and instead used herbs as treatment, allegedly at Perry's urging. Perry operates the General Health Care Facility for Preventive and Alternative Medicine in Columbus. A grand jury has been asked to decide whether to indict Perry on a charge of practicing medicine without a license.

In Australia, a husband and wife were found guilty of manslaughter in the case of a woman who died while undergoing a "spiritual diet." The Supreme Court in Brisbane sentenced 61-year-old Jim Pesnak and his wife Eugenia to six and three years in jail, respectively. They have been described as "cult leaders" who encouraged followers to fast. The victim, a 53-year-old Melbourne woman, suffered deteriorating health after six days on the diet, and finally lapsed into respiratory failure five days later. The Pesnaks failed to provide medical attention for the victim, instead relying on "spiritual strength" to heal her.

*—Benjamin Radford*


AT LAST!
THE FAMED CLAIRVOYANT TELLS HER OWN TRUE DETECTIVE TALES!
DOROTHY ALLISON
A PSYCHIC STORY
DOROTHY ALLISON AND SCOTT JACOBSON

## 'Psychic Detective' Dorothy Allison Dies

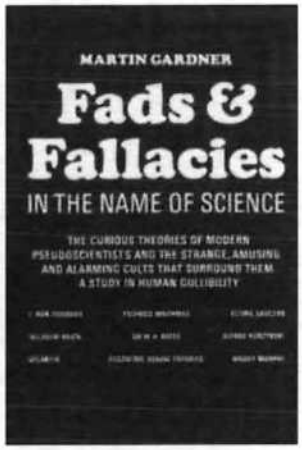
Dorothy Allison—who gained fame, or infamy, as a self-proclaimed psychic sleuth—died on December 1, 1999, at age 74.

Although she convinced many reporters and even police that she had a criminological sixth sense, skeptics observed that the Nutley, New Jersey, great-grandmother propelled herself into prominence by a tried-and-true formula: arrive on the scene of high-profile cases, make numerous vague pronouncements and, after the true facts become known, interpret the statements accordingly—a technique known as "retrofitting."

For example, a 1997 episode of TV's *Crackdown on Crime* said of Allison: "Nutley police asked her to find a missing five-year-old boy. She did. He had drowned in a pipe during a storm." In fact, however, every one of those statements is untrue. It was Allison who approached police with a "vision." Not only did she fail to locate the child's body, but she caused police to waste considerable resources in digging up a drainage pipe she had identified. The boy's body was actually discovered later, floating in a pond, by a man seeking a spot to bury his dead cat. But through the technique of retrofitting, Allison converted her failure into a seeming success, mentioning details of the boy's clothing that she had supposedly "seen" accurately.

In her obituary, *The New York Times* observed that Allison was unsuccessful in solving the Patty Hearst kidnapping, the "Son of Sam" killings, the Atlanta child murders, or the death of JonBenet Ramsey—all cases in which Allison insinuated herself. "Skeptics," noted the *Times*, "many armed with volumes of research, insist that psychics never solved a single crime." That was certainly true of Allison who nevertheless made a name for herself by convincing people otherwise.

*—Joe Nickell*


MARTIN GARDNER
Fads & Fallacies
IN THE NAME OF SCIENCE
THE CURIOUS THEORIES OF MODERN PSEUDOSCIENTISTS AND THE STRANGE, AMUSING AND ALARMING CULTS THAT SURROUND THEM. A STUDY IN HUMAN GULLIBILITY

## Top 100 Science Books of the Century

Two classic works of skeptical investigation are among the top 100 science books of the century, selected by *American Scientist* magazine.

Martin Gardner's entertaining and influential survey of pseudoscientists, *In the Name of Science* (1952, long available in a Dover reprint as *Fads and Fallacies in the Name of Science*), and Oskar Pfungst's *Clever Hans* (1911), a classic investigation into experimental animal and human psychology and self-deception (the talking animal fallacy), were among the 100 "or so" top science books of the century selected by the editors of *American Scientist* and Philip and Phylis Morrison, longtime contributors to *Scientific American*'s books pages.

Most works on the list are of interest to anyone interested in the history and philosophy of science.

The list includes Einstein's *The Collected Papers* and *The Meaning of Relativity*, Darwin's *Autobiography* (included via its 1950 edition), Bertrand Russell and Alfred North Whitehead's *Principia Mathematica*, Erwin Schrödinger's *What Is Life?*, George Gamow's *One, Two, Three . . . Infinity*, Rachel Carson's *Silent Spring*, Lewis Thomas's *Lives of a Cell*, Mary Leakey's *Laetoli*, Richard Feynman's *Surely You're Joking, Mr. Feynman!* and *QED*, and Carl Sagan's *The Pale Blue Dot*.

It includes Vannevar Bush's *Science: The Endless Frontier*, Thomas Kuhn's *The Structure of Scientific Revolutions*, C.P. Snow's *The Two Cultures*, Jacob Bronowski's *Science and Human Values*, Peter Medawar's *The Art of the Soluble*, and Karl Popper's *The Logic of Scientific Discovery*.

Current working scientists are well represented as well. They include James Watson, *The Double Helix*; Freeman Dyson, *Disturbing the Universe*; Lynn Margulis and Karlene V. Schwartz, *Five Kingdoms*; Stephen Hawking, *A Brief History of Time*; Jane Goodall, *In the Shadow of Man*; Steven Weinberg, *Dreams of a Final Theory*; Edward O. Wilson, *The Insect Societies*; Marvin Minsky, *The Society of Mind*; Richard Dawkins, *The Blind Watchmaker*; Stephen Jay Gould, *Ever Since Darwin*; Stephen Pinker, *The Language Instinct*; and Douglas Hofstadter and Michael Dennett, *The Mind's I*.

The full list and commentary are in the November/December 1999 *American Scientist*.

*—Kendrick Frazier*

*Kendrick Frazier is Editor of the* SKEPTICAL INQUIRER. □

# Fund for the Future

CSICOP AT THE CENTER FOR INQUIRY

*CFI-International*
*Amherst, N.Y.*

## Promote CSICOP

**Using the Media & Telecommunications to Promote Science and Reason**

The Fund for the Future is a capital campaign to provide CSICOP with the resources needed to more effectively influence media and public opinion. The 90s were defined by a telecommunications revolution, along with an explosion of misinformation available to the scholar and citizen alike. The hunger for superstition, pseudoscience, the paranormal and miraculous solutions has never been more acute.

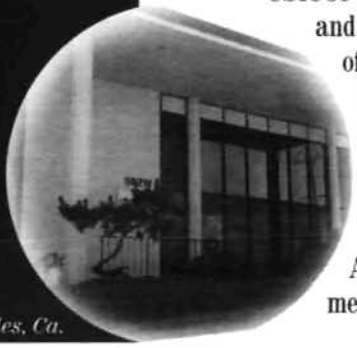
## The Ten-Year Plan

*CFI-Midwest*
*Kansas City, Mo.*

**Contributions are needed for current priorities:**

- Increased media appearances by skeptical spokespersons
- Press releases, opinion pieces and media alerts
- Greater exposure through the Internet, including webcasting
- National initiatives coordinated by the Council for Media Integrity
- Instructional materials introducing skepticism to elementary and secondary school students
- Video production

## How Can You Help?



*CFI-West*
*Los Angeles, Ca.*

CSICOP has established its expertise and integrity. It's time to command more media attention and a larger audience. The Center for Inquiry Fund for the Future is about new methods of outreach and broader influence, and is driven by an ambitious ten-year strategic plan for growth.

We depend on the support of readers and friends to continue leading the international skeptical movement. Gifts to the Fund for the Future provide the resources we need to respond to today's challenges.

All gifts are gratefully accepted. The Fund for the Future welcomes gifts of encouragement and major investments.

Cash contributions and gifts of stock are needed for immediate growth and new initiatives. We also offer a range of planned giving opportunities, from bequests to assorted tax-advantaged trusts and pooled funds. Planned gifts support our work in the future and can provide an income stream for you and a beneficiary. You may also make a gift supporting the general endowment, or establish a special purpose fund underwriting a long-term project that expresses your personal interests and commitment to skepticism.

In today's stock market, gifts of highly appreciated securities offer particular advantages to the donor. When donating stock to a charitable organization, you avoid taxes and maximize the impact of the asset you are donating.

Contact Anthony Battaglia at (716) 636-7571 ext. 311 or via e-mail at CFIANTHONY@AOL.COM to discuss accomplishing your philanthropic and financial goals and contributing to the Fund for the Future.

*Bill Nye "The Science Guy," Joe Nickell, and entertainer Steve Allen appear on a radio show.*

**CSICOP**
**at the Center for Inquiry**
P.O. Box 703
Amherst, NY 14226-0703
(716) 636-1425 ext. 311
Fax (716) 636-1733

*Co-chairs of the Fund for the Future Campaign: above, author and TV personality Steve Allen; below, author and critic Martin Gardner.*

## Council for Media Integrity

Formed just weeks after its inclusion in the Ten-Year Plan, the Council for Media Integrity monitors and challenges media programs that convey unfounded claims and mislead the public about science. Members include Steve Allen (co-chair), E. O. Wilson, Stephen Jay Gould, and many others. CSICOP will invest in electronic infrastructure to facilitate rapid response to irresponsible programs.

## Enhanced Library Resources

The Center for Inquiry's skeptics' library—already the finest of its kind in the world—needs additional funding to enlarge its core collection and add electronic media. Worldwide modem access to the library's catalog is already nearly complete.

## Adult Education

The Council cosponsors the Center for Inquiry Institute, which has already expanded its offerings to include a new three-year certificate program in science and skepticism. Courses are scheduled in Amherst, Los Angeles, and other cities.

## Regional Outreach

With the establishment of The Center for Inquiry–West (Los Angeles), The Center for Inquiry–Midwest (Kansas City) and The Center for Inquiry–Rockies (Boulder, Colorado), giant steps have been taken to enhance direct field service to skeptical activists. Additional regional centers are planned, with expanded calendars of activities.

## Focusing Upon the Young

To present the skeptical message more compellingly to the young, CSICOP will develop new materials—ranging from age-appropriate print publications to audio and video cassettes and instructional coursework. *Goals include enhanced understanding of science and improved critical thinking skills.*

# Mad Messiahs

The word *Christ* is Greek for Messiah. When the woman at the well asked Jesus if he was indeed the Messiah, he replied, "I that speak unto thee am he" (John 4:26). Christians have always assumed he was exactly that. Jews of the time obviously could not agree. After all, Jesus failed to restore Jewish power and to bring about a world of peace and justice.

Over the centuries following Christ's death, scores of Jews in Europe either claimed to be the promised Messiah, or were so regarded by their followers. The history of these false claimants is well summarized in Albert Hyamson's seven-page article "Messiahs (Pseudo-)," in James Hastings' *Encyclopaedia of Religion and Ethics*, Volume 8. Here I shall be concerned mainly with Sabbatai Sebi (his name is also spelled Shabbetai Zevi), the most famous of such claimants. He was responsible for the largest messianic movement in Jewish history.

Sabbatai was born in Smyrna, the former name of the Turkish port of Izmir, the son of a Spanish employee of a British mercantile firm. The exact date of his birth is unknown, but was probably 1626. As a youth he was said to be unusually handsome and intelligent, with a fine singing voice.

*Martin Gardner's two-volume* Annotated Alice *has recently been reprinted in a one-volume edition.*

There was widespread belief among Jews of time (when they were under harsh persecution) that the Messiah would soon appear and restore them to their homeland. Young Sabbatai immersed himself in the Cabala and its complex numerology. Encouraged by his father, he slowly persuaded himself that he was none other than the anticipated Anointed One. It was not long before his vigorous preaching won him a large following of fervent disciples known as Sabbateans.

In the 1650s the rabbis of Turkey branded Sabbatai a heretic, excommunicated him, and booted him out of Smyrna. In Salonica, where he continued preaching, he met similar resistance and was expelled from that city also. Such expulsions only increased the number and enthusiasm of his followers. Two early marriages ended in divorce before Sarah, a Polish woman of great beauty, announced that God had told her she was to be the Messiah's bride. Sabbatai sent for her, and they were married in Cairo in 1664.

After several years of wandering about the Orient, preaching and gaining new converts, Sabbatai returned to Smyrna in 1665 where he openly proclaimed himself the Messiah and was welcomed with high enthusiasm. About half of all orthodox Jews around the world were now convinced that Sabbatai was indeed the King of the Jews who would lead them back to their Promised Land. One of his top devotees, Nathan Levi of Gaza, assumed the role of Elijah by proclaiming that Sabbatai was Israel's true savior and that 1666 marked the beginning of the Messianic Age.

The tale now takes an astonishing, comic turn. In Constantinople, in 1666, Sabbatai was arrested by the Sultan of Turkey, put in chains, and sentenced to prison. The Sultan gave him a choice of either being executed or converting to Islam. Sabbatai and his wife at once converted!

Sabbatai's tens of thousands of followers were of course crushed. As the *Encyclopaedia Britannica*'s eleventh edition puts it, the Sabbateans reacted with "a sense of shame joined to feelings of despair." The false Messiah's books and letters were burned. His name was so thoroughly erased from Jewish history that it was almost as if he never existed. Scholars today who are acquainted with his strange life believe he was a seriously deranged manic-depressive of great charisma during his manic phases, and given to frequent bizarre behavior.

After Sabbatai's conversion to Islam, he took the name of Aziz Mehmed Effendi, and founded Dönmeh (Turkish for "apostates"), a weird Muslim cult that combined Islamic theology with Jewish beliefs and rituals. After Sarah died in 1674, Sabbatai married a woman named Esther. Eventually he was banished to Dulcigno, now in Yugoslavia, where he

died in 1676.

A small number of Sabbateans continued to honor his memory. The last of their leaders was Jankiev Lebowicz, a Polish charlatan who took the name Jacob Frank. Born in 1726, the son of a Polish rabbi, he claimed to be the reincarnation of Sabbatai. Eventually he and his followers, known as Frankists, converted to Russian orthodox catholicism! In 1760 Frank was arrested in Warsaw on a charge of heresy, and spent thirteen years in prison. After his release he called himself the German Baron of Offenbach. According to Hastings' *Encyclopaedia*, "He lived in state until his death in 1791 . . . in various continental capitals, always with an immense retinue and a vast treasure derived from his infatuated adherents." After his death his daughter Eva headed the Frankist cult as its "holy mistress" until she died in 1816. Not until the early 1900s did the cult finally totally expire.

There have been many false messiahs since, but none who gained the widespread devotion of the man later called The Mad Messiah. For details about his life see the article in Hastings' *Encyclopaedia* previously cited, and the thirty pages on him in *The Jewish Encyclopedia*. See also its seventeen pages on Jacob Frank. A German book on Sabbatai, by Josef Kastein, was translated and published in 1931 by Viking with the title *Messiah of Ismir*. Israel Zangwill wrote a brilliant fictionalized account of Sabbatai's life in *Dreamers of the Ghetto* (1948). On August 10, 1997, and in later reruns, the TV series *Mysteries of the Bible* featured Sabbatai's deranged career.

What is the current situation regarding the Second Coming of Jesus and the Jewish messianic hope? Both Judaism and Christianity are now divided into three main groups. In Christendom, fundamentalists continue to expect to be raptured into the skies any day now, before the world as we know it approaches its demise. Conservative Christians, Protestant and Catholic, follow Saint Augustine in moving the time of the Second Coming so far into the future, and so vague in meaning, that they seldom think about it. Liberal Christians long ago took the Second Advent to be no more than a symbol of the world's gradual progress. Julia Ward Howe, a Unitarian minister, opened her great "Battle Hymn of the Republic" with "Mine eyes have seen the glory of the coming of the Lord." She did not mean a literal return of Jesus. For her the Civil War, by abolishing the evil of slavery, was a major step in progress toward a saner world. Onward Christian soldiers!

Religious Jews fall into three similar camps. The orthodox follow Maimonides, who wrote, "I believe in perfect faith in the coming of the Messiah, and though he tarry, I will wait daily for his coming." Conservative Jews have pushed the date far into the future and are as vague about its significance as conservative Christians are about the return of Jesus. Reform Jews regard the Messiah as no more than a symbol of hope for a world free of war and major injustices. Now that Jews have restored their homeland and regained political power, it seems unlikely that demented claimants like Sabbatai will flourish once more to flimflam the faithful.

Nevertheless, in spite of the endless false messiahs in the past, ultra-orthodox Jews around the world periodically declare that the true Messiah is either here or on his way here to work great wonders. They saw the collapse of Soviet Communism as a great sign that the promised redeemer was already on the scene.

The latest instance of such frenzy broke out in Israel in 1992. An ultra-orthodox group called the Habad suddenly decided that the Messiah was about to declare himself. They put up large billboard signs all over Israel saying "Prepare for the Coming of the Messiah." Similar messages appeared on bumper stickers, and on electric signs atop cars. A full-page ad in the *New York Times* was titled, "The time for your redemption has arrived."

The Habad is a branch of the Lubavitch movement, named after the Russian village in Smolensk where it began in the eighteenth century. Lubavitchians in turn are part of Hasidism. Most Habad/Lubavitch/Hasidism followers live in Israel and in New York City.

And who was the Messiah that the Habadniks claimed was on the verge of revealing his identity? None other than Menachem Mendel Schneerson (1902–1994), then an 89-year-old rabbi living in Brooklyn! Schneerson came from a family that for two centuries had been leaders of the Habad movement. There are some 200,000 such believers worldwide, with 30,000 living in New York City where Schneerson was their world leader.

Rabbi Schneerson never claimed to be the Messiah, but his incessant preaching that the Messianic Age was about to begin, together with feeble disclaimers that he wasn't the chosen one, persuaded the Israeli Habadniks that the Messiah was none other than Schneerson himself. They built a house for him in Kfar Habad, a Tel Aviv suburb where most of them lived. Although Schneerson remained silent about being the Messiah, his followers in Israel became more and more persuaded that he would soon declare himself and move to Israel. Rabbi Adin Steinsaltz, a famous Talmudic scholar, declared that Schneerson was "the most likely person" then living who could turn out to be the long-awaited redeemer.

Other orthodox Jews in Israel were incensed by all this commotion. They denounced the Habad claims as blasphemy. According to *Time* (March 21, 1992), Eliezer Schach, a 96-year-old Israeli rabbi who had long been Habad's chief enemy, said Schneerson was insane, an infidel, and a false Messiah. He even accused the Habadniks of eating pork and other non-kosher food.

Rabbi Schneerson was a short man with bright blue eyes and a large snow-white beard that made him look like a jolly Santa Claus. Born in the Ukraine and educated in Berlin and Paris as an engineer, he soon became the world leader of the Habad Lubavitchians. His International Educational Network, headquartered in Brooklyn's Crown Heights at 770 Eastern Parkway, is an outreach organization with its own TV

*MAD MESSIAHS*
*Continued on page 30*

**INVESTIGATIVE FILES**

JOE NICKELL

# The Secrets of Oak Island

It has been the focus of "the world's longest and most expensive treasure hunt" and "one of the world's deepest and most costly archaeological digs" (O'Connor 1988, 1, 4), as well as being "Canada's best-known mystery" (Colombo 1988, 33) and indeed one of "the great mysteries of the world." It may even "represent an ancient artifact created by a past civilization of advanced capability" (Crooker 1978, 7, 190). The subject of these superlatives is a mysterious shaft on Oak Island in Nova Scotia's Mahone Bay. For some two centuries, greed, folly, and even death have attended the supposed "Money Pit" enigma.

## The Saga

Briefly, the story is that in 1795 a young man named Daniel McInnis (or McGinnis) was roaming Oak Island when he came upon a shallow depression in the ground. Above it, hanging from the limb of a large oak was an old tackle block. McInnis returned the next day with two friends who—steeped in the local lore of pirates and treasure troves—set to work to excavate the site. They soon uncovered a layer of flagstones and, ten feet further, a tier of rotten oak logs. They proceeded another fifteen feet into what they were sure was a man-made shaft but, tired from their efforts, they decided to cease work until they could obtain assistance. However, between the skepticism and superstition of the people who lived on the mainland, they were unsuccessful.

The imagined cache continued to lie dormant until early in the next century, when the trio joined with a businessman named Simeon Lynds from the town of Onslow to form a treasure-hunting consortium called the Onslow Company. Beginning work about 1803 or 1804 (one source says 1810), they found oak platforms "at exact intervals of ten feet" (O'Connor 1978, 10), along with layers of clay, charcoal, and a fibrous material identified as coconut husks. Then, at ninety feet (or eighty feet, according to one alleged participant) they supposedly found a flat stone bearing an indecipherable inscription (see figure 1). Soon after, probing with a crowbar, they struck something hard—possibly a wooden chest!—but discontinued for the evening. Alas, the next morning the shaft was found flooded with sixty feet of water. Attempting to bail out the pit with buckets, they found the water level remained the same, and they were forced to discontinue the search. The following year, the men attempted to bypass the water by means of a parallel shaft from which they hoped to tunnel to the supposed treasure. But this shaft suffered the same fate, and the Onslow Company's expedition ended (O'Connor 1978, 9–16; Crooker 1993, 14; Harris 1958, 12–22).

Again the supposed cache lay dormant until in 1849 another group, the Truro Company, reexcavated the original shaft. Encountering water, the workers then set up a platform in the pit and used a hand-operated auger to drill and remove cores of material. They found clay, bits of wood, and three links of gold chain—supposed evidence of buried treasure. The Truro Company sank additional nearby shafts, but these, too, were inundated with water, and work ceased in the fall of 1850. Other operations continued from 1858 to 1862, during which time a workman was scalded to death by a ruptured boiler (O'Connor 1988, 17–31).

The Oak Island Association followed and attempted to intersect the "tunnel" that presumably fed water to the pit. When that 120-foot shaft missed, another was sunk and, reportedly, a three-by-four-foot tunnel was extended about eighteen feet to the "Money Pit" (as it was then known). However, water began coming in again. A massive bailing operation was then set up when suddenly there was a loud crash as the Money Pit collapsed. It was later theorized that the imagined chests had fallen into a deep void and that the pit may have been booby-trapped to protect the treasure (O'Connor 1988, 29). The Association's work was followed in 1866 by the Oak Island Eldorado Company but without

*Joe Nickell is CSICOP's Senior Research Fellow.*

significant results (Harris 1958, 203).

Decades elapsed and in 1897 the Oak Island Treasure Company (incorporated four years earlier) apparently located the long-sought "pirate tunnel" that led from Smith's Cove to the Money Pit. They drilled and dynamited to close off the tunnel. Subsequent borings were highlighted by the discovery of a fragment of parchment upon which was penned portions of two letters (possibly "ri"). They also found traces of a chalk-like stone or "cement" (Harris 1958, 91–98). In this same year Oak Island's second tragedy struck when a worker was being hoisted from one of the pits and the rope slipped from its pulley, plunging him to his death.

After that company ran out of funds, most of the moveable assets were sold at a sheriff's sale in 1900. The new century brought continued searches, with the digging of innumerable drill holes, shafts, and tunnels—so many that "The entire Money Pit area has been topographically demolished, changing completely its original appearance and rendering old maps and charts useless" (Crooker 1978, 190). In 1965 there came yet another tragedy when four men died in a shaft after being overcome either by swamp gas or engine fumes (O'Connor 1988, 143–145).

In 1966 a Florida building contractor named Dan Blankenship teamed up with Montréal businessman David Tobias to continue the quest. The partners began an extensive drilling operation, sinking some sixty boreholes the following year alone, and, in 1968, enlisted a number of investors in what they named Triton Alliance. Unfortunately, mechanical problems, land disputes, the Stock Market crash of 1987, and other troubles, including the eventual falling out of the two partners, stopped their projected $10 million "big dig" (Randle 1995). Once open to tourists, the site sank into neglect.

Over the years the fabled treasure has been the target of dowsers, automatic writers, clairvoyants, channelers, tarot-card readers, dream interpreters, psychic archaeologists, and assorted other visionaries and soothsayers, as well as crank inventors of devices like a "Mineral Wave Ray" and an airplane-borne "treasure smelling" machine—not one having been successful (Preston 1988, 62; O'Connor 1988, 121–136; Finnan 1997, 166–170).

## An Investigative Approach

The more elusive the treasure has proved, the more speculation it has engendered. Given the "immense amount of labor" presumably required to construct the pit and the accompanying "flooding tunnel" that served as a "booby trap," presumption of a pirates' hoard has begun to be supplanted by such imagined prizes as the French crown jewels, Shakespeare's manuscripts, the "lost treasure" of the Knights Templar, even the Holy Grail and the imagined secrets of the "lost continent" of Atlantis (Sora 1999, 7–38, 101; Crooker 1978, 153).

But is there a treasure at the bottom of the "Money Pit"? My research into the mystery of Oak Island dates back many years, and I opened a file on the case in 1982. However, except for periodic updates, I put it on hold, largely because the solution seemed to lie in the same direction as those of some other mysteries (Nickell 1980; 1982a; 1982b). However, when asked to address a forensic conference in nearby New Brunswick, I resolved to place Oak Island on my itinerary (Nickell 2000).

In planning my trip I attempted to contact Triton's David Tobias, who did not, however, return my call, but I did reach Jim Harvey at the Oak Island Inn and Marina on the nearby mainland. Harvey, a retired Royal Canadian Mounted Police officer and licensed private investigator, is in charge of security for Oak Island, and he was adamant that it is no longer open to visitors. Making not-so-veiled references to the legendary temper of Dan Blankenship, the other Triton partner who still lives on the island, Harvey suggested it would not be safe for me to trespass on the island, although he offered for hire his cabin cruiser for a guided circumnavigation.

Harvey may have had in mind an incident of many years ago, involving an altercation between Blankenship and another island resident, Frederick Nolan. According to one source: "One day Blankenship had approached with a rifle in hand and an ugly situation had begun to develop. Eventually the police were called in to calm everybody down and confiscate the gun" (Finnan 1997, 93).

So it was with some trepidation

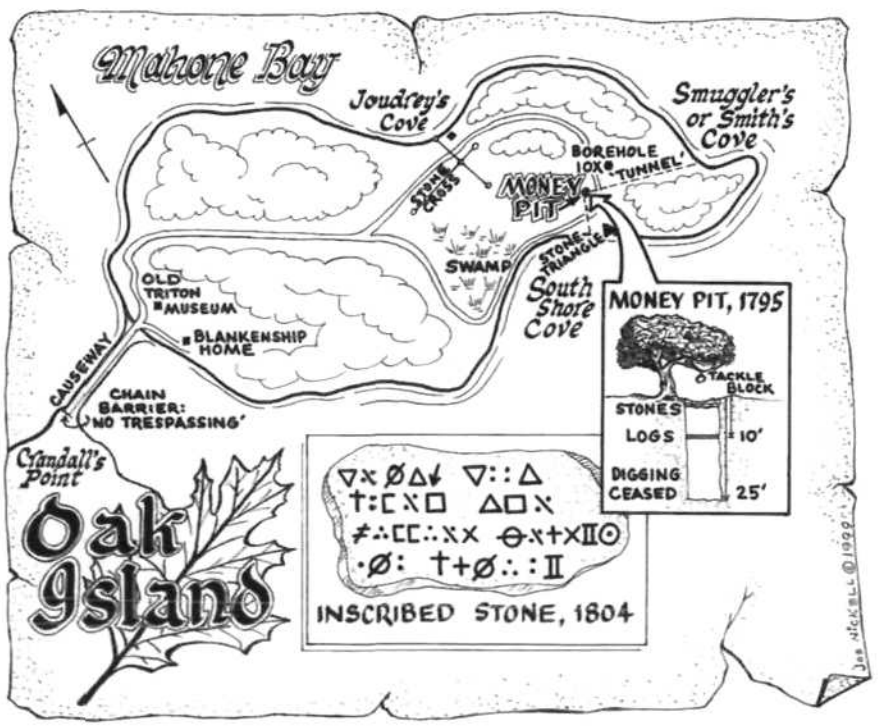



Figure 1. Oak Island "treasure map" (illustration by author).

that—on the afternoon of July 1, 1991, after arriving at the village of Western Shore and checking in at the Oak Island Inn—I drove to the causeway leading to Oak Island. This land bridge connecting the island to the mainland was constructed in 1965 so that a great excavating machine could be transported to the "treasure" area. Today it is chained off and marked "Private/No Hunting or Trespassing/Danger."

A local fisherman responded to my proposal to walk over and talk to Mr. Blankenship, "He won't shoot you, but he will probably turn you back." In fact, although Blankenship was at first standoffish, having read a Canadian Press article about the "professional skeptic" who was heading to Oak Island (see Nickell 2000), I soon mollified him, and he graciously invited me to his home. I was there until nearly 11 P.M., being shown artifacts, photos, papers, and a video made by a camera lowered into a borehole—the fruits of almost thirty-five years of treasure hunting that had earned Blankenship the title of "Oak Island's most obsessive searcher" (O'Connor 1988, 145). The video reveals the interior of a "tunnel," graced with an apparent upright timber and what some imagine to be "chests," a "scoop," and other supposed artifacts. Blankenship (1999) told me he had located the site of the borehole by dowsing. The next day Jim Harvey took me on our prearranged boat trip, permitting me to view the remainder of the island (see figure 2).

The more I investigated the Oak Island enigma, the more skeptical I became. Others had preceded me in supplying what I came to regard as the two main pieces of the puzzle, although apparently no one had successfully fitted the pieces together. One concerned the nature of the "money pit" itself, the other the source of certain elements in the treasure saga, such as the reputed cryptogram-bearing stone.

## Man-made or Natural?

Doubts begin with the reported discovery in 1795 of the treasure shaft itself. While some accounts say that the trio of youths spied an old ship's pulley hanging from a branch over a depression in the ground (Harris 1958, 6–8), that is "likely an apocryphal detail added to the story later" and based on the assumption that some sort of lowering device would have been necessary in depositing the treasure (O'Connor 1988, 4). Nevertheless some authors are remarkably specific about the features, one noting that the "old tackle block" was attached to "a large forked branch" of an oak "by means of a treenail connecting the fork in a small triangle" (Crooker 1978, 17). Another account (cited in Finnan 1997, 28) further claims there were "strange markings" carved on the tree. On the other hand, perhaps realizing that pirates or other treasure hoarders would have been unlikely to betray their secret work by leaving such an obvious indicator in place, some versions of the tale agree that the limb "had been sawed off" but that "the stump showed evidence of ropes and tackle" (Randle 1995, 75).

Similarly, the notion that there was a log platform at each ten-foot interval of the pit for a total of nine or eleven platforms, is only supported by *later* accounts, and those appear to have been derived by picking and choosing from earlier ones so as to create a composite version of the layers. For example the account in the *Colonist* (1864) mentions that the original treasure hunters found only flagstones at two feet ("evidently not formed there by nature") and "a tier of oak logs" located "ten feet lower down" (i.e., at twelve feet). They continued some "fifteen feet farther down," whereupon—with no mention of anything further of note—they decided to stop until they could obtain assistance. James McNutt, who was a member of a group of treasure hunters working on Oak Island in 1863, described a different arrangement of layers (Crooker 1978, 24).

In 1911 an engineer, Captain Henry L. Bowdoin, who had done extensive borings on the island, concluded that the treasure was imaginary. He questioned the authenticity of various alleged findings (such as the cipher stone and piece of gold chain), and attributed the rest to natural phenomena (Bowdoin 1911). Subsequent skeptics have proposed that the legendary Money Pit was nothing more than a sinkhole caused by the ground settling over a void in the underlying rock (*Atlantic* 1965). The strata beneath Oak Island are basically limestone and anhydrite (Crooker 1978, 85; Blankenship 1999), which are associated with the formation of solution caverns and salt domes (Cavern 1960; Salt Dome 1960). The surface above caverns, as well as over faults and fissures, may be characterized by sinkholes.

Indeed, a sinkhole actually appeared on Oak Island in 1878. A woman named Sophia Sellers was plowing when the earth suddenly sank beneath her oxen. Ever afterward known as the "Cave-in Pit," it was located just over a hundred yards east of the Money Pit and directly above the "flood tunnel" (O'Connor 1988, 51).

Geologist E. Rudolph Faribault found "numerous" sinkholes on the mainland opposite Oak Island, and in a geological report of 1911 concluded there was "strong evidence" to indicate that the purported artificial structures on the island were "really but natural sink holes and cavities." Further evidence of caverns in the area came in 1975 when a sewage-disposal system was being established on the mainland. Approximately 3,000 feet north of the island, workmen excavating with heavy machinery broke through a rock layer and discovered a 52-foot-deep cavern below (Crooker 1993, 144). Fred Nolan insists that, earlier, in 1969, while drilling on Oak Island, Triton broke into a cavern near the fabled treasure shaft at a depth of 165 feet. "Blankenship and Tobias figured that the cavern was man-made," said Nolan, "but it isn't, as far as I'm concerned" (Crooker 1993, 165). And Mark Finnan (1997, 111), writing of "the unique geological nature of Oak Island," states as a fact that "naturally formed underground caverns are present in the island's bedrock." These would account for the flood "booby-traps" that were supposedly placed to guard the "treasure" (Preston 1988, 63).

Today, of course, after two centuries of excavation, the island's east end is "honey combed with shafts, tunnels and drill holes running in every imaginable direction" (Crooker 1978, 190), complicating the subterranean picture and making it difficult to determine the nature of the original pit. In suggesting that it was a sinkhole, caused by the slumping of debris in a fault, one writer noted that "this filling would be softer than the surrounding ground, and give the impression that it had been dug up before" (*Atlantic* 1965). Fallen trees could have sunk into the pit with its collapse, or "blowdowns" could periodically have washed into the depression (Preston 1988, 63), later giving the appearance of "platforms" of rotten logs.

Just such a pit was in fact discovered in 1949 on the shore of Mahone Bay, about five miles to the south of Oak Island, when workmen were digging a well. The particular site was chosen because the earth was rather soft there. Reports O'Connor (1988, 172–173): "At about two feet down a layer of fieldstone was struck. Then logs of spruce and oak were unearthed at irregular intervals, and some of the wood was charred. The immediate suspicion was that another Money Pit had been found."

The treasure seekers and mystery mongers are quick, however, to dismiss any thoughts that the "shaft" and "tunnels" could be nothing more than a sinkhole and natural channels. Why, the early accounts would then have to be "either gross exaggerations or outright lies," says one writer (O'Connor 1988, 173). For example, what about the reported "pick marks found in the walls of the pit" (O'Connor 1988, 173)? We have already seen—with the oak-limb-and-pulley detail—just how undependable are such story elements. Then what about the artifacts (such as the fragment of parchment) or the coconut fiber (often carried on ships as dunnage, used to protect cargo) found at various depths? Again, the sinkhole theory would explain how such items "worked their way into deep caverns under the island" (Preston 1988, 63).

## Secrets Revealed

Assuming the "shaft" is a natural phenomenon, there still remains the other major piece of the Oak Island puzzle: How do we explain the presence of such cryptic elements as the cipher stone allegedly discovered in the pit in 1803, a large equilateral triangle (made of beach stones and measuring ten feet on each side) found in 1897, or a megalithic cross which Fred Nolan discovered on the south shore in 1981? (See figure 1; Finnan 1997, 36, 68–69, 79–82.)

By the early 1980s I had become aware of parallels between Oak Island's Money Pit and the arcana of the Freemasons. Theirs is not, they insist, a "secret society" but a "society with secrets." Carried to North America in the eighteenth century, Masonry has been defined as "a peculiar system of morality veiled in allegory and illustrated by symbols" (*Masonic Bible* 1964, 26). One of the essential elements of any true Masonic group is "a legend or allegory relating to the building of King Solomon's Temple" ("Freemasonry" 1978). And an allegory of the Secret Vault, based on Solomon's fabled depository of certain great secrets, is elaborated in the seventh or Royal Arch degree. Among the ruins of the temple, three sojourners discover the subterranean chamber wherein are found three trying-squares and a chest, identified as the Ark of the Covenant (*Masonic* 1964, 12, 37, 63; Lester 1977, 150; Duncan 1972).

No doubt many readers have encountered Secret Vault symbolism—which pertains to lost secrets, buried treasure, and the grave (Macoy 1908, 445; *Revised* 1975, 64 n.22)—without recognizing it as such. For example, Sir Arthur Conan Doyle, a Freemason, not only employed Masonic allusions in several of his Sherlock Holmes stories (Bunson 1994, 84) but penned three that evoke Masonry's hidden vault itself. For instance, Holmes uncovers dark secrets in "The Adventure of Shoscombe Old Place." Beneath an old chapel on the Shoscombe property, accessed by stumbling through "loose masonry" (an obvious pun) and proceeding down a steep stairway, Holmes finds himself in a crypt with an "arched . . . roof" (evoking the Royal Arch degree of Masonry). Accompanied by his client—a "Mr. Mason"!—Holmes finds the key to a series of strange mysteries. Similarly allusive Holmes stories are "The Red-Headed League" (featuring a client who sports a Masonic breastpin), and the suggestively titled "The Musgrave Ritual."

In addition to the Sherlockian Secret Vault allegories there are several examples of the genre that many people have taken at face value, believing them true accounts. One, for example, is the tale of Swift's Lost Silver Mine of eastern Kentucky. In his alleged journal, one "Jonathan Swift" explored the region prior to Daniel Boone, marking a tree with "the symbols of a compasses, trowel and square"—Masonic emblems—and discovering and mining silver (which geologists doubt exists in the region). Leaving to seek backers, Swift says he stored the treasure in a cave and "walled it up with masonry form." Later he became blind and unable to find his fabled treasure (although still capable of writing in his journal!). This evokes Masonic ritual wherein a candidate must enter the lodge in *complete blindness* (i.e. blindfolded) to begin his quest for enlightenment (Nickell 1980).

Another such lost-treasure story is found in the purported Beale Papers which tell a tale of adventure, unsolved ciphers, and fabulous treasure. This was "deposited" in a stone-lined "vault" (using language from the Select Masters' degree) in Virginia. The papers were published by a Freemason (Nickell 1982b).

Then there is the "restless coffins" enigma of the Chase Vault of Barbados. According to proliferating but historically dubious accounts, each time the vault was opened, between 1812 and 1820, the coffins were discovered in a state of confusion. After they were reordered the vault was closed by "masons." Yet the coffins would again be found in disarray. At least two of the men involved were high-ranking Freemasons. In 1943 another restless-coffins case occurred on the island, this time specifically involving *a party of Freemasons* and the vault being that of *the founder of Freemasonry in Barbados* (Nickell 1982a)

It now appears that another such tale is the legend of Oak Island, where again we find unmistakable evidence of Masonic involvement. There are, of course, the parallels between the Money Pit story and the Masonic Secret Vault allegory. The "strange markings" reportedly carved on the oak adjacent to the Pit suggest *Masons' Marks*, inscribed signs by which Masons are distinguished (Waite 1970, xx; Hunter 1996, 58). The three alleged discoverers of the Pit would seem to represent the *Three Worthy Sojourners* (with Daniel McInnis representing the *Principal Sojourner*), who discover the Secret Vault in the Royal Arch degree (Duncan 1972, 261). In that ritual the candidate is lowered on a rope through a succession of trap doors, not unlike the workmen who were on occasion hauled up and down the (allegedly platform-intersected) Oak Island shaft. The tools used by the latter—notably spades, pickaxes, and crowbar (O'Connor 1988, 2; Harris 1958, 15)—represent the three *Working Tools* of the Royal Arch Mason (Duncan 1972, 241). Indeed, when in 1803 workers probed the bottom of the Pit with a crowbar and struck what they thought was a treasure chest, their actions recall the Royal Arch degree in which the Secret Vault is located by a sounding blow from a crowbar (Duncan 1972, 263). The parallels go on and on. For example, the soft stone, charcoal, and clay found in the Pit (Crooker 1978, 24, 49) are consistent with the *Chalk, Charcoal and Clay* cited in the Masonic degree of Entered Apprentice as symbolizing the virtues of "freedom, fervency and zeal" (Lester 1977, 60; Hunter 1996, 37).

Then there are the artifacts. Of course many of these—like the old branding iron found in the swamp (Crooker 1993, 175, 176)—are probably nothing more than relics of the early settlers. Some are actually suspicious, like the links of gold chain found in the Pit in 1849. One account holds that they were planted by workers to inspire continued operations (O'Connor 1988, 177–178).

Other artifacts are more suggestive, like the cipher stone (again see figure 1) which disappeared about 1919. Its text has allegedly been preserved, albeit in various forms and decipherments (Rosenbaum 1973, 83). For instance zoologist-turned-epigrapher Barry Fell thought the inscription was ancient Coptic, its message urging people to remember God lest they perish (Finnan 1997, 148–149). In fact, the text as we have it has been correctly deciphered (and redeciphered by several investigators, me included). Written in what is known as a simple-substitution cipher, it reads, "Forty Feet Below Two Million Pounds Are Buried" (Crooker 1993, 23). Most Oak Island researchers consider the text a hoax (O'Connor 1988, 14), but as Crooker (1993, 24) observes, an inscribed stone *did* exist, "having been mentioned in all the early accounts of the Onslow company's expedition." Significantly, a cipher message (with key), found in the Secret Vault, is a central aspect of Freemasonry's Royal Arch degree (Duncan 1972, 248–249).

Figure 2. Offshore view of Oak Island showing site of Borehole 10X. The "Money Pit" lies just beyond.

Other artifacts (Finnan 1997, 67, 80, 83) that appear to have ritualistic significance are the stone triangle and great "Christian Cross" as well as "a hand-worked heart-shaped stone"—Masonic symbols all. Crooker (1993, 179) notes that "a large amount of time and labor" were spent in laying out the cross, but to what end? Could it have been part of a Masonic ritual?

An "old metal set-square" found at Smith's Cove may simply be an innocent artifact, but we recall that three small squares were among the items found in the Secret Vault (Duncan 1972, 243). Indeed, the square is one of the major symbols of Freemasonry which, united with a pair of compasses, comprises the universal Masonic emblem.

*Explicitly* Masonic, I believe, are certain inscribed stones on the island. These include one discovered at Joudrey's Cove by Gilbert Hedden in 1936. It features a *cross* flanked by the letter H, said to be a modification of the Hebraic letter for Jehovah, and a prime Masonic symbol known as a *Point Within a Circle*, representing mankind within the compass of God's creation (Morris n.d., 47; Finnan 1997, 66, 151). Another clearly Masonic stone is a granite boulder found near the Cave-in Pit in 1967. Overturned by a bulldozer it bore on its underside the letter "G" in a rectangle (what Masons term an *oblong square*). *G* denotes the Grand Geometer of the Universe—God, the central focus of Masonic teachings—and is "the most public and familiar of all symbols in Freemasonry," observes Mark Finnan (1997, 152). He continues: "The presence of this symbol on Oak Island and its location in the east, seen as the source of light in Masonic teachings, is further indication that individuals with a fundamental knowledge of Freemasonry were likely involved."

Indeed, the search for the Oak Island treasure "vault" has been carried out largely by prominent Nova Scotia Freemasons. I had an intimation of this years ago, but it fell to others, especially Finnan who gained access to Masonic records, to provide the evidence. Freemasonry had come to Nova Scotia in 1738 and, concludes Finnan (1997, 145), "it is almost a certainty that organizers of the first coordinated dig . . . were Masonicly associated." Moreover, he states: "Successive treasure hunts throughout the past two hundred years

often involved men who were prominent members of Masonic lodges. Some had passed through the higher levels of initiation, and a few even held the highest office possible within the Fraternity."

They include A. O. Creighton, the Oak Island Association treasurer who helped remove the cipher-inscribed stone from the island about 1865, and Frederick Blair, whose family was involved in the quest as far back as 1863. Blair, who formed the Oak Island Treasure Company in 1893, was a "prominent member" of the lodge in Amherst, Nova Scotia. Treasure hunter William Chappell was another active Mason, and his son Mel served as Provincial Grand Master for Nova Scotia from 1944 to 1946 (Finnan 1997, 145–146). Furthermore, discovered Finnan (1997, 146):

> The independently wealthy Gilbert Hedden of Chatham, New Jersey, who carried out the treasure search from 1934 to 1938, and Professor Edwin Hamilton, who succeeded him and operated on the island for the next six years, were also Freemasons. Hamilton had at one time held the office of Grand Master of the Grand Lodge of Massachusetts. Hedden even made it his business to inform Mason King George VI of England about developments on Oak Island in 1939, and Hamilton corresponded with President [Franklin D.] Roosevelt, another famous Freemason directly associated with the mystery.

(Roosevelt actually participated in the work on Oak Island during the summer and fall of 1909.) Other Masonic notables involved in Oak Island were polar explorer Richard E. Byrd and actor John Wayne (Sora 1999, 12; Hamill and Gilbert 1998).

Significantly, Reginald Harris, who wrote the first comprehensive book on Oak Island at the behest of Frederick Blair, was an attorney for Blair and Hedden. Himself a thirty-third-degree Mason, Harris was provincial Grand Master from 1932 to 1935. Among his extensive papers were notes on Oak Island, scribbled on the backs of Masonic documents and sheets of Masonic letterhead. The papers show that at least one Oak Island business meeting was held in the Masonic Hall in Halifax, where Harris had an office as secretary of the Grand Lodge (O'Connor 1988, 93; Harris 1958, vii; Finnan 1997, 143; Rosenbaum 1973; 154).

One investigator, Ron Rosenbaum (1973, 154), discovered that among Harris's papers were "fragments of a Masonic pageant" that were apparently "designed to accompany the rite of initiation into the thirty-second degree of the Masonic Craft." The allegory is set in 1535 at the Abbey of Glastonsbury, where the Prime Minister is attempting to confiscate the order's fabulous treasures. But one item, the chalice used at the Last Supper—the Holy Grail itself—is missing, and secret Masons are suspected of having hidden it for safekeeping. The allegory breaks off with them being led to the Tower for torture.

Given this draft allegory by Harris, it may not be a coincidence that some recent writers attempt to link the Holy Grail to Oak Island. They speculate that the fabled chalice is among the lost treasures of the Knights Templar, precursors of the Freemasons (Sora 1999, 180, 247–251).

In any event, the evidence indicates a strong Masonic connection to the Oak Island enigma. Others have noted this link but unfortunately also believed in an actual treasure of some sort concealed in a man-made shaft or tunnel (Crooker 1993; Finnan 1997; Sora 1999; Rosenbaum 1973). Only by understanding both pieces of the puzzle and fitting them together correctly can the Oak Island mystery finally be solved.

In summary, therefore, I suggest first that the "Money Pit" and "pirate tunnels" are nothing of the sort but are instead natural formations. Secondly, I suggest that much of the Oak Island saga—certain reported actions and alleged discoveries—can best be understood in light of Freemasonry's Secret Vault allegory. Although it is difficult to know at this juncture whether the Masonic elements were opportunistically added to an existing treasure quest or whether the entire affair was a Masonic creation from the outset, I believe the mystery has been solved. The solution is perhaps an unusual one but no more so than the saga of Oak Island itself.

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# ET, You've Got Mail

If you're looking for solid evidence of extraterrestrial life, the best place to find it might be out in a national park, or on a vendor's table or, better yet, on an online auction site. The Web site http://www.marslife.com, whose owner is listed as Mike Moore of Amarillo, Texas, claims to have discovered numerous samples of alien life (not even fossilized, just dried) on what it calls the "Frass meteorite," which supposedly has been traced back to Mars. Among the life forms supposedly discovered in it are a Martian spider, a black worm, a Martian flower, and even a mysterious "Martian bugger," all of which are supposed to be 13 million years old and are being covered up by the powers that be. Fragments of the supposed Martian meteorite were offered for sale on the online auction site eBay last July for "just $5,000," and an "alien flying insect" for "just $1,000,000." The seller isn't saying if these prices were actually obtained.

But Ron Ruiz of Oro Valley, Arizona, has gone one better, offering for sale at a Tucson gem show for $69,000 a potato-sized green rock that supposedly came from the crash of a liquid-hulled alien spaceship that crashed in St. Joseph, Missouri, in 1947. "It seems like an awfully high amount, but there is very little of it," Ruiz told the *Arizona Daily Star* (February 5, 1999). Smaller pieces were available for $100 per gram, and at least four pieces were actually sold. However, skeptic James McGaha checked out the remarkable evidence, and suggests that it was probably a piece of slag, the refuse from metal smelting. You can decide for yourself what it is by looking at www.wehug.com/crashsitedebris.html. Actual pieces of supposed Roswell crash debris were on sale at the Bay Area UFO Expo held near San Francisco over the Labor Day holiday but seemed to generate little enthusiasm, probably because even the credulous UFO buffs in attendance found them unconvincing.

But you've got to give credit to Jose Escamilla of Roswell, New Mexico, who seems to have worked out a whole new angle in the crowded field of paranormal claims. They're called "Roswell Rods," and they allegedly zip through the air, never seeming to stop or slow down. Supposedly first discovered at Roswell, the Rods have now been seen almost everywhere that anyone has bothered to look for them. Seldom seen visually, the best way to spot them is to take a video or movie camera and point it at the sky. Sooner or later some little dark spot will be seen to zip across at high angular velocity, and when it does you will have a Rod sighting. "Rods have never been slow," Escamilla explains. "These things travel at extremely high velocities and can barely be seen as they pass by. We have never seen a Rod hover or fly slowly as reports of cigar UFOs suggest. Most footage of Rods lasts from one to five frames in duration. What we consider to be the slowest Rods we have ever seen on video last a full ten frames before flying off screen. These ten frames equal one-third of a second." I attended his lecture and video presentation. Some of his "rods" were obviously insects zipping across the field at a high angular rate. Others appear to have "appendages" in stop-frame video, apparently birds' wings blurred in zipping across the frame. Escamilla is convinced he's onto something really big here. His Web site, www.roswellrods.com, claims to have had more than 7 million visitors in the past three years, and he says he's now aggressively pursuing movie and television deals.

The charismatic and controversial UFOlogist Steven Greer (see this column, September/October 1999) recently revealed on his Web site http://www.cseti.org the real reason for the death of Marilyn Monroe. Greer claims to have an "authenticated CIA wiretap document of Marilyn Monroe signed by legendary Counter-Intelligence Chief James Angleton the day before her death detailing that she knew about the crashed spacecraft and

*Robert Sheaffer's World Wide Web page for UFOs and other skeptical subjects is at www.debunker.com.*

dead bodies from Jack Kennedy and was planning a Press Conference to tell all—and more!" Unfortunately, if you want to read the full story, you'll have to buy Greer's new book.

Another wild-and-wooly UFO group, Citizens Against UFO Secrecy (see this column, September/October 1998) has filed a lawsuit complaining that the U.S. Government and the State of Arizona jointly are failing to protect citizens against a foreign invasion, specifically, abduction by extraterrestrials (see http://www.caus.org/crindex.html). The state, not surprisingly, has filed a motion to dismiss the case. However, its response deals with the suit not by showing that it is unsubstantiated and ridiculous, but instead claiming the state has "Qualified Immunity" and that the suit would "interfere with public administration," even if the state's citizens were actually being abducted. Another lawsuit was directed against the Department of Defense for allegedly withholding UFO secrets requested under the Freedom of Information Act. Still in the works are planned lawsuits against the FBI and the CIA.

Still another UFOlogist, Larry W. Bryant of MUFON, recently filed a Freedom of Information Act request with the medical center at the Andrews Air Force Base, as follows:

> Word has come to me that your facility routinely administers medical care (including counseling services, on both an in-patient and an out-patient basis) to servicemembers (and their family members) exhibiting symptoms of having undergone abduction by "extraterrestrial biological entities" (a.k.a. UFO-borne aliens).
>
> Accordingly, under terms of the U.S. Freedom of Information Act, I hereby request that you send me a copy of the following records:
>
> (1) The standard treatment plan pursued by your personnel in caring for these above-defined victims.
>
> (2) All statistical-survey reports produced to date on the demographics, etiology, treatment protocols, long-term prognosis, and forensic evidence relating to your care of these victims. . . .

There is, as yet, no word about any deep secrets he may have pried loose. James Moseley reports in *Saucer Smear* (http://www.martiansgohome.com/smear) that Bryant is considering a lawsuit similar to that filed by CAUS against the state of Virginia, where he resides, charging that it, like Arizona, has failed to protect its citizens against alien abduction. But MUFON is leaning on Bryant to nix the suit, as MUFON considers it abysmally bad public relations.

**The group has set up a Web page and seriously expects to receive an e-mail message from a highly advanced alien intelligence that has figured out a way to hack into a terrestrial Internet connection.**

However, according to one very earnest group of SETI researchers, the most promising way to detect extraterrestrial intelligence is not using sophisticated radio equipment or even ordinary telescopes, but instead setting up a Web page and waiting patiently for ET to log on. The group, sixteen of whom are members of the International Academy of Astronautics SETI Committee, calls itself "Welcome ETI." It has set up a Web page (http://members.aol.com/WelcomeETI/) and seriously expects to receive an e-mail message from a highly advanced alien intelligence that has figured out a way to hack into a terrestrial Internet connection.

This, however, is more difficult than it sounds, assuming that the ETs must abide by the same laws of physics as us Earthlings. The Internet protocols require the assignment of unique network addresses—even to ETs—and are inherently bi-directional. This means that ETs cannot just passively surf the net, but must enter data into the Internet in order to receive data from it. As for tapping into communications channels, we know that this is something that terrestrial intelligence agencies routinely can do.

However, if the ETs have placed an intelligent probe somewhere in our solar system that wishes to somehow insert data into one of our terrestrial microwave data links that is not expecting to receive it, because of delays of seconds if not minutes in the information round-trip at the speed of light, the un-hacked data would have reached its destination long before any extraterrestrial hacking could be accomplished (unless the ETs are precognitive and know what data will be transmitted in the future).

After I exchanged several e-mails with the group's organizer, Allen Tough, he agreed that because of these and other difficulties a successful alien hacker would have to have a presence on Earth instead of in space, which as I explained sounds very much like the plot for an episode of *The X-Files*. This suggests that the proper equipment for a SETI researcher might not be expensive telescopes and radio spectrum analyzers, but a hand-held scanner and a four-wheel drive vehicle. The group says that it has already received thirty replies claiming to be from ETs, however "none have yet come close to persuading us of their authenticity."

* * *

The *National Enquirer* reported in its September 14, 1999, edition that Jackie Stallone, Sly Stallone's mom, has given up astrology for an even more bizarre form of fortunetelling: "rumpology," reading the imprint of a person's posterior. Clients remove their pants, sit on an ink-coated paper, then creating an impression in which the prognosticator interprets the lines and wrinkles. "It's all written on your behind who you're going to marry, love affairs, health—and most important of all in Hollywood, whether you're going to have a successful career," she told the *Enquirer*. □

# Risky Business

## *Vividness, Availability, and the Media Paradox*

*The popular media deliver reports on a carefully chosen set of events in vivid detail. Owing to its concrete, personal, and emotional flavor, this biased sample of information is easily retrievable from memory and therefore exerts a disproportionate influence on our judgments and decisions. This results in the media paradox: The more we rely on the popular media to inform us, the more apt we are to misplace our fears.*

JOHN RUSCIO

Do you believe that more people die in the United States each year from falling airplane parts or from shark attacks? From tornadoes or from lightning? From stomach cancer or from car accidents? From diabetes or from homicide? When we evaluate the relative degree of danger associated with different hazards, we can easily overlook two subtle biases in the sample of information that comes to mind. First, the popular media report to us, in vivid detail, a carefully selected assortment of unusual events. Second, vivid and unusual events exert a disproportionate influence on our subsequent judgments through their increased memorial availability. These two biases operate hand-in-hand to create what I call the "media paradox":

The more we rely on the popular media to inform us, the more apt we are to misplace our fears.

In one widely cited study, college students ranked nuclear power as the most dangerous of thirty different activities and technologies. Experts in risk assessment, on the other hand, ranked nuclear power twentieth on the same list, less hazardous than riding a bicycle (Slovic, Fischhoff, and Lichtenstein 1979). Ross (1995) reviews several serious misperceptions of risk and poses the critical question, "Are we then turning our backs on a raging inferno while we douse the flame of a match?" (53).

## Vividness

Many of us rely on the popular media (television, radio, newspapers, magazines, the Internet, and so forth) for daily information to help navigate the hazards in the world around us. These sources, however, do not provide us with a representative sampling of events. For a variety of reasons—including fierce competition for our patronage within and across the various popular media outlets—potential news items are rigorously screened for their ability to captivate an audience. Stories featuring mundane, commonplace events don't stand a chance of making it onto the six o'clock news. The stories that do make it through this painstaking selection process are then crafted into accounts emphasizing their concrete, personal, and emotional content. Each of these aspects of a story promotes its vividness, which increases the likelihood that we will attend to and remember the information (Nisbett and Ross 1980; Plous 1993).

Both anecdotal and empirical evidence demonstrates the impact of vividness. Imagine that you are in the market for a new car, and you turn to *Consumer Reports* for advice.[1] Several hundred consumers' experiences, plus the opinions and road tests of automotive experts, are neatly summarized, and it appears that the cost and reliability of a Honda Civic will best meet your transportation needs. Before making a purchase, however, you happen to mention your decision to a colleague, who is shocked. "A Honda! You must be joking! A friend of mine bought one and had nothing but trouble. First the fuel injection system broke, then the brakes, and finally the transmission. He had to sell it for scrap within three years!" The vividness of this warning makes it quite compelling. How many of us can honestly say that we would treat it in a rationally appropriate manner, fairly weighing the favorable evidence from several hundred consumers plus a consensus of automotive experts against the unfavorable evidence from one second-hand account?

Of course, I would not expect to convince you of the significance of vividness with a single vivid example. Experimental investigations more definitively illustrate the impact of vivid information. For example, Borgida and Nisbett (1977) asked introductory psychology students to rate their interest in taking each of ten upper-level psychology courses. To help make these ratings, all students were randomly assigned to one of three informational conditions. Those in a "base rate" condition read a statistical summary of course evaluations from "practically all the students who had enrolled in the course the previous semester." A small panel of advanced students shared their views on the ten courses with participants in a "face-to-face" condition. The panelists prefaced their remarks by reporting the same average numerical evaluations that were provided in the statistical summary to "base rate" participants. Finally, participants in a control condition were given no information about the courses.

Compared to the control group, students receiving the statistical summary expressed slightly greater interest in the recommended courses. More important, students hearing the panel discussion expressed considerably greater interest in the recommended courses. The face-to-face presentation of information had a more pronounced impact on students' preferences than did the statistical summary of a far larger number of previous students' responses.[2] Moreover, this effect was stronger among students who had recently decided to major in psychology than among students who had declared other majors. Personal relevance appears to magnify the power of vividness.

The popular media capitalize on this power in many ways. Why, in a story on the effects of welfare reform on thousands of families across a state, does nine-tenths of the report consist of an interview with one affected individual? Why is the logic of "going beyond the statistics and onto the streets" to examine an issue persuasive to viewers, listeners, or readers? Producers are aware that a scientific analysis is not as emotionally compelling as one (carefully chosen) individual's personal experiences. Why does a television news reporter stand in front of a courthouse when sharing a landmark verdict reached earlier that day? Why does a weather correspondent endure frigid temperatures, sleet, and harsh wind on camera to inform us that a severe storm is in progress? Even superficial background elements appear to add a sense of realism and concreteness to a story.

## Availability

Having been exposed to a biased sample of vivid information through popular media outlets, what impact does this have on our subsequent decisions? Psychologists have discovered that our judgments of frequency and probability are heavily influenced by the ease with which we can imagine or recall instances of an event. Consider these two problems from the research literature. First, from among a group of ten people, are there more distinct ways to form a two-member or a five-member committee? Second, supposing that you have randomly sampled an English word from a text, is it more likely that it begins with the letter "k" or that "k" is its third letter?

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Tversky and Kahneman (1973) found that participants in their studies systematically and predictably erred on both of these problems. In the first problem, it is perhaps easier to imagine forming smaller committees, which readily differ from one another, than larger ones, which overlap substantially. In fact, there are only forty-five ways to form two-member committees but 252 ways to form five-member committees. In the second problem, it is surely easier to bring to mind words that begin with "k" than words with "k" as the third letter, but extensive word-counts indicate that the latter outnumber the former by a ratio of roughly two to one. In fact, you might not have noticed that there have already been eleven words with "k" as the third letter in this article, but only one occurrence with "k" as the first letter—and even that occurrence could be disqualified on the grounds that it was a proper name at the beginning of this paragraph, "Kahneman."

**The media paradox operates this way: Events must be somewhat unusual in order to be considered newsworthy, but the very fact of their appearance in the news leads us to overestimate their frequency of occurrence.**

What these exercises reveal is that our judgments are indeed biased by the ease of imagining or recalling information. In everyday life, what makes one event more available in memory than another? One crucial determinant is vividness. When we search through our memory to reach a judgment of frequency or probability, the most easily retrieved instances are often those that are concrete, personal, and emotional. Students in the course selection experiment, for example, are more likely to remember the views expressed by panelists than the comparatively pallid statistical summaries. Likewise, a news report will leave a more lasting impression by documenting one individual's personal suffering than by providing a scientific argument based on "mere statistics."

Because our judgment is affected by the ease with which instances of an event can be recalled, rather than a careful evaluation of all the logically possible events weighted by their actual frequency of occurrence, the simple presence of one memory and absence of another can short-circuit a fully rational evaluation. We seldom take notice of *non-occurrences*, such as the *absence* of crime or accidents (Nisbett and Ross 1980). Still more rare are popular media reports on the absence of events—unless of course this absence itself represents a dramatic change from the status quo, as when a large city witnesses a significant drop in homicide rates. Richard Bach (1973) once wrote of a young couple's fear when they embarked on their first trip on an airplane:

> In all that wind and engineblast and earth tilting and going small below us, I watched my Wisconsin lad and his girl, to see them change. Despite their laughter, they had been afraid of the airplane. Their only knowledge of flight came from newspaper headlines, a knowledge of collisions and crashes and fatalities. They had never read a single report of a little airplane taking off, flying through the air and landing again safely. They could only believe that this must be possible, in spite of all the newspapers, and on that belief they staked their three dollars and their lives (37).

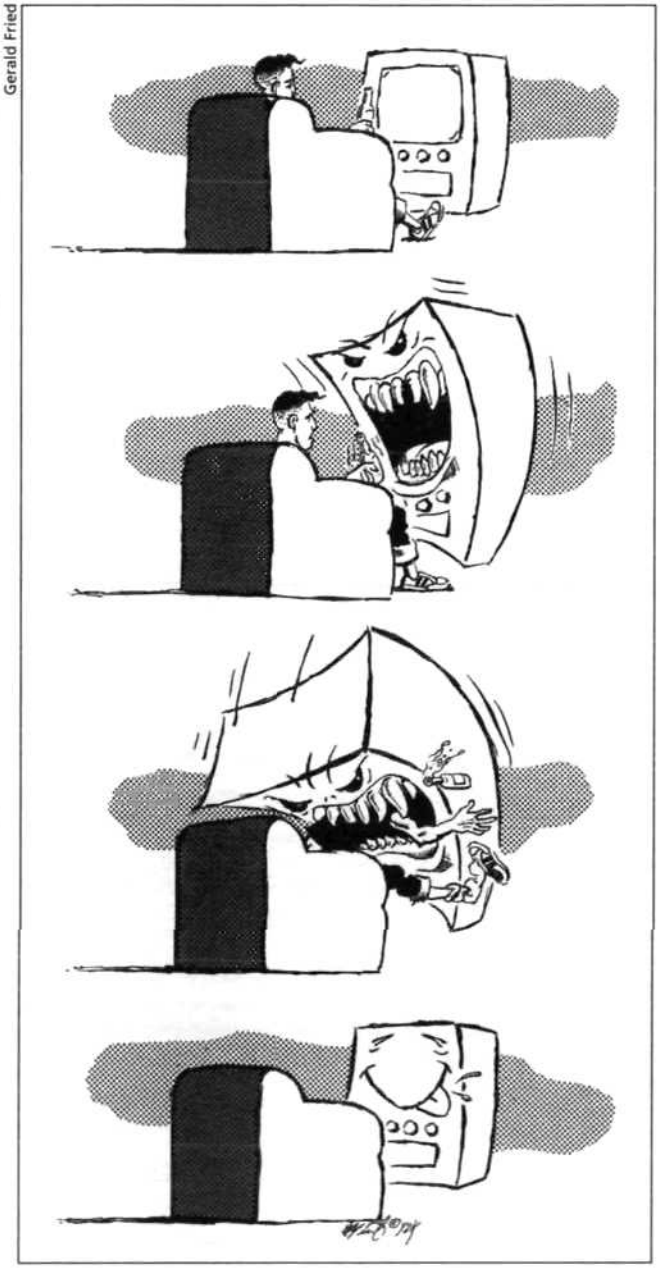
## The Media Paradox

Bach's passage on a couple's fear of flying highlights the joint operation of vividness and availability on our judgment, which ultimately results in the media paradox. We have likely all heard or read that, per mile traveled, flying is much safer than driving. Given this fact, media coverage of air travel catastrophes may actually steer us in the wrong direction: onto the more hazardous roadways. Indeed, a classic series of studies on the judged frequency of lethal events underscores the powerful impact that media coverage has on our perceptions of risk. College students and members of the League of Women Voters were asked to estimate the frequency with which forty-one causes of death occurred each year in the United States (Lichtenstein, Slovic, Fischhoff, Layman, and Combs 1978). Two systematic biases were uncovered in analyses of these judgments. First, frequencies of the least common causes of death were overestimated, whereas frequencies of the most common causes of death were underestimated. In many cases, the judgments were off by more than an order of magnitude. Second, relative to the best-fitting curve that characterized the relationship between judged and actual frequencies across all forty-one causes of death, those that were overestimated tended to be the ones that received more extensive media coverage. For example, motor vehicle accidents and homicide were overestimated relative to the best-fitting curve, whereas smallpox vaccination and diabetes were underestimated.

Following up on this evidence that suggests a connection to the media, Combs and Slovic (1979) closely scrutinized the actual reporting of deaths in their regional newspapers (the Eugene, Oregon, *Register Guard* and the New Bedford, Massachusetts, *Standard Times*). During alternate months for one year, they counted the number of articles about, the number of occurrences of, and the number of reported deaths resulting from each of the forty-one causes of death. The two newspapers were almost perfectly consistent in their coverage of deaths (correlations across the causes of death were .98, .94, and .97 for the three indices listed above). This is interesting in that newspapers with vastly different readerships nonetheless still find certain types of deaths to be more "newsworthy" than others.[3] More important, there was an impressive correspondence between judged and reported frequencies of death, with a correlation of about .70. This substantial correlation was not due to a

common link between both judged and reported frequencies with actual frequencies of death. In fact, when actual frequency was statistically held constant, the correlations were much higher, .89 and .85 for the two newspapers.

Tempting as it may be, however, we must be careful not to conclude on the basis of this correlational evidence alone that the media are necessarily responsible for distorting our perceptions of risk. It may be just the opposite: perhaps media professionals are simply responsive to our fears and interests, reporting what they perceive to be newsworthy to us. It may be that a "third variable"—such as the relative degree of controllability or the catastrophic nature inherent in different causes of death—causes both our fears and media coverage. A case can be made for each of these explanations for the observed link between media coverage and beliefs, as well as others, and the broad array of factors that are involved appear to be complexly intertwined.


Gerald Fried

Fortunately, however, we are in a position to evaluate this relationship armed with more than correlational evidence. Evidence from controlled experimentation shows a causal influence of vivid information on our judgments, and the additional causal influence of memorial availability on our judgments represents a likely mediator of the vividness effect. This knowledge makes it very difficult to deny that the media exerts some measure of causal influence on our fears. Debating the strength of this effect or whether it operates in a reciprocal fashion is certainly worthwhile, but it does not allow us to escape from the conclusion that any systematic departure from reality in the media is likely to be mirrored in our beliefs.

## Falling Airplane Parts Revisited

Aside from a close miss by what was reported to be a falling airplane part early in *The Truman Show*, I cannot personally recall ever having heard of such an incident, fictitious or real. Students over the years have told me that they recall stories of people having *found* fallen airplane parts, but not of an actual fatality resulting from such falling parts. Shark attacks, on the other hand, are easily imagined and widely reported. Moreover, in the first movie that comes to my mind, the shark in *Jaws* actually did cause several fatalities. It may come as some surprise, then, to learn that in an average year in the United States thirty times more people are killed by falling airplane parts than by shark attacks ("Death Odds" 1990).

By this point, it has probably become evident how Plous (1993) constructed all four of the questions that I borrowed at the beginning of this article. Within each pair of causes of death, one tends to be reported more frequently than the other in the popular media. The correct answers (as given by Plous 1993) are: falling airplane parts, lightning, stomach cancer, and diabetes.

Simply put, then, the media paradox operates this way: Events must be somewhat unusual in order to be considered newsworthy, but the very fact of their appearance in the news leads us to overestimate their frequency of occurrence. We may therefore come to believe that relatively rare events are common, taking precautionary measures against unlikely dangers at the neglect of more significant hazards. At any given time, we are bombarded with warnings about particular hazards that often turn out to be far less significant threats to our well-being than initially advertised. Gilovich (1991) discussed widespread media reports on the chances of contracting HIV through heterosexual sex. He quotes Oprah Winfrey as having said that "Research studies now project that one in five heterosexuals could be dead from AIDS at the end of the next three years. That's by 1990. One in five. It is no longer just a gay disease. Believe me." This has obviously turned out to be a gross exaggeration, and although the transmission of

HIV through heterosexual sex is a serious public health issue, it is nonetheless important to keep the degree of danger in perspective.

A healthy dose of skepticism is one obvious way to protect ourselves from misplacing our fears. We can routinely ask ourselves simple questions, such as, "Why did the producers choose to air this story?" or "How common is the problem being described?" Gilovich (1991) outlines several other strategies for protecting ourselves from misplaced fears, such as considering the source of information, distrusting projections, and being wary of testimonials.

## A Radical Conjecture

To respond to Ross's (1995) question, it appears that we may sometimes dowse a match and ignore a raging inferno. I suggest something more radical still. I propose that a mindful review of cautionary advisories may paradoxically alert us to pockets of relative safety. That is, some media reports intended to shield us from danger may, upon careful reflection, actually signal precisely the opposite. Let me illustrate this notion through a pair of examples.

Once when I used to live in a suburb of Boston, a local fast-food franchise was temporarily closed for violations of the health code. To put it gently, the illnesses of several patrons had been traced back to unfortunate encounters with food at the salad bar. The local media quite naturally ran stories about this. When the time came for the restaurant to reopen, at least one local newspaper printed a follow-up story to remind local residents of the danger. I would suggest that, of all the places one could grab a quick bite to eat, this particular restaurant was among the *safest*, at least in the short run. The management surely must have realized that a second problem, so soon after the last, would have spelled disaster. The knowledge that everyone—patrons and health inspectors alike—would be keeping a close watch on food quality would surely have heightened attentiveness to the issue.

If the choice of a fast-food restaurant strikes you as trivial, consider a decision with more profound, long-range consequences. On March 28, 1979, an accident occurred at the Three Mile Island (TMI) nuclear power plant in Middletown, Pennsylvania. As the twentieth anniversary of this tragic event approached, there was considerable publicity here in south-central Pennsylvania, publicity which no doubt awakened memories and rekindled old fears. Around this time, a candidate for a faculty position at the college where I work declined a job offer because the candidate's spouse refused to live so close to TMI. Now, not only do experts in risk assessment consider nuclear power to be quite safe, but I would contend that of all the nuclear power plants in the world, TMI is likely to be among the very safest. Nobody would tolerate another accident, and the operators of TMI have been forced to take extraordinary precautions for the past two decades. They will surely continue to do so, compelled as they are by their own widely-publicized track record.

Media professionals have a penchant for dramatizing case studies of mishap, be they accidental or malicious. When an incident is brought to the public's attention, it is possible to overlook the fact that the alleged perpetrators are themselves sensitized to the issue, and thus likely to be exercising renewed vigilance. Therefore, not only should we be extremely careful about accepting media warnings at face value, but an even more robust skepticism may point to a sensible course of action 180 degrees at odds with the directions mapped out in a vivid story.

I encourage readers to consider the broader implications of the media paradox. With practice, we may learn to protect ourselves from the subtle biases that pervade popular media reports, but does this go far enough? One's own critical thinking habits will provide insufficient protection against ill-advised *policy* decisions based upon prevailing misconceptions that have spread through the mass media. As spelled out in the experimental work of Shanto Iyengar (Iyengar 1991; Iyengar and Kinder 1987), media effects on ordinary citizens' political judgments raise grave concerns about the stability of a democratic system that rests upon a well-informed public.

## Notes

1. This example is adapted from Nisbett, Borgida, Crandall, and Reed (1976).

2. In order to control for the possibility that the face-to-face condition achieved a large effect by providing critical information not contained in the statistical summary, a replication of this experiment included a condition in which the base rate group received—in addition to the statistical summary—a complete written transcript of the panelists' comments. This new condition was also less influential in affecting students' preferences than was the face-to-face condition (Borgida and Nisbett 1977).

3. This is not simply a result of each newspaper reporting deaths in accordance with the actual frequencies of occurrence. For example, homicides were reported three times as often as deaths by diseases despite the fact that diseases killed about 100 times as many people.

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# Physics and the Paranormal

## *A Theoretical Physicist's View*

*The co-recipient of the 1999 Nobel Prize in Physics explains how modern physics and biology restrict the possibilities for physical explanations of the paranormal.*

GERARD 't HOOFT

Reports from people who claim to have had paranormal experiences emerge so often that it seems there must be more than pure chance at work. Many people think that there might be physical explanations for these phenomena. Might not premonitions be explained by those particles that move backwards in time? Such ideas, though based on a superficial knowledge of twentieth-century physics, are not unreasonable. Popular expositions about modern physics seem to offer two pretexts for such ideas, namely leeway and loose ends.

The first pretext is the description of modern physics itself. For example, in quantum mechanics we have the so-called Heisenberg Uncertainty Principle. This means that

combinations of statements about the smallest building blocks of nature cannot be simultaneously valid to arbitrary degrees of accuracy. If the position of a particle is determined very precisely, then its momentum (mass times velocity) will fluctuate unpredictably. So one might imagine that one can influence these fluctuations paranormally. It is also said that modern field theories admit particles that "travel back in time." An uninformed outsider cannot possibly understand what this means, but can merely guess that it makes predicting the future possible. In short, modern physics seems to offer leeway to the paranormal.

**All organisms, plants and animals alike, have various abilities that exploit all natural phenomena that are reliable enough to be used. But we never see living animals practice any kind of paranormal power, we don't find different organisms that have developed these powers to different degrees.**

As a theoretical physicist I must assert most emphatically that this leeway is only apparent. There is *absolutely no way* one can explain the paranormal in this fashion.

Quantum mechanics consists of two parts: mathematics and randomness. Mathematics describes the evolution and other properties of a system, using the so-called wave function. It does so with truly incredible precision. These calculations determine probability distributions for the outcomes of experiments. Quantum theory is so successful because nature sticks to these distributions with uncanny accuracy. That is what we observe, anyway. If any kind of paranormal phenomenon could influence these probability distributions, then this would constitute an observable violation of the theoretical predictions. We would have to rewrite the mathematical equations for the wave functions. But the necessary revisions are excluded by the causality principle, which is a very reliable pillar of the whole of theoretical physics.

The same goes for the field theory of elementary particles. That particles might travel backwards in time is an illusion. The actual building blocks of matter are called "particles" and "anti-particles." Both move in an ordinary fashion "forward" in time. If one calculates complicated processes, it turns out that sometimes a particle and antiparticle can appear or disappear together. We speak about "creation" and "annihilation." A diagram of a creation process looks ostensibly like a particle that "comes back from the future" and then turns around instantaneously, but actually it is just the antiparticle going to the future. It is not a violation of the causality principle. On the contrary, the existence of antiparticles is dictated by the causality principle.

The second pretext for explanations of paranormal phenomena are the loose ends of modern physics, the unsolved problems. Again popularizations of physics serve as inspiration. It is unknown how gravitation must be reconciled with quantum mechanics. Isn't that a matter of curved space and time and wormholes? Isn't this notoriously difficult quantum mechanics messing things up? And most of the mass in the universe seems to be utterly intangible or even missing! Is it not obvious that physical explanations for the paranormal are just waiting to be discovered?

I think it is not really a weakness of modern science that we show our problems in so much detail. It is no secret that our work isn't done yet. Understandably, amateur physicists feel a challenge here. However this is a field where nonexperts regrettably cannot make substantial contributions. The circumstances for which our present knowledge is essentially insufficient are so extreme that at the present time no experiment can produce them. They only happen in thought experiments, where we can have extremely strong fields or where particles approach each other very closely with absurdly high kinetic energies. These circumstances, where laws of physics are still poorly-understood, simply never arise inside human brain tissue, so that the weakness of modern science cannot even serve as a beginning of an excuse for paranormal effects.

Other deviations from the Standard Model are associated with extremely weak interaction phenomena, so weak in fact that no particle detector has yet found them. Such might be the interactions with this mysterious dark matter of the universe. But where all detectors fail, there is little hope for our brain tissue to succeed, let alone use these interactions for some kind of information exchange.

Modern biology further restricts the possibilities for physical explanations for the paranormal. All organisms, plants and animals alike, have various abilities that exploit all natural phenomena that are reliable enough to be used. These abilities are passed on through their genes from one generation to the next, and are gradually honed by adaptations and trial and error. This is unavoidable, because the laws of optics and acoustics, for instance, have all kinds of restrictions. So some kind of practice is necessary, across the generations or in the life of a single individual—or both. But we never see living animals practice any kind of paranormal power, we don't find different organisms

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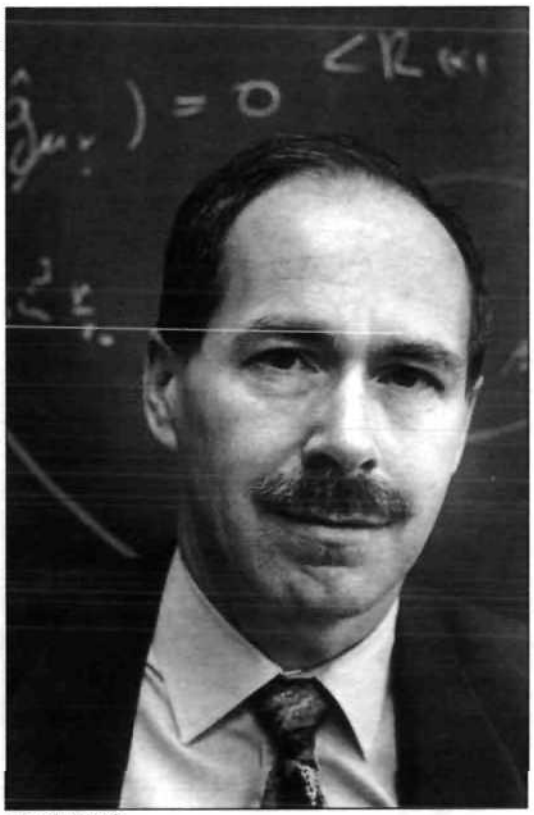
that have developed these powers to different degrees. It is hard to understand how flawless handling of such elusive "supernatural phenomena" could ever come into being. A psychic "knows" that he or she "sees" something, but where does this knowledge come from? What these people claim doesn't tie in with what we know about how organisms learn things.

All the same there are many people who have had one or more paranormal experiences. I list the most common types.

- A premonition, either as a conscious feeling or as dream. This seems to imply a violation of causality.
- Clairvoyance, seeing special events in a far past or far away. This requires an unknown form of information transfer.
- Near-death experiences and out-of-body experiences. These phenomena seem to demand the existence of an immaterial soul, separate from the body but still capable of perception, thinking, and consciousness. This is rather a medical matter, but it also seems to require some new kind of physics.
- Seeing extraterrestrials or their vehicles. The problem is not so much the existence of extraterrestrial civilizations, but the implied space travel. From a physical point of view, nearly all known conservation laws—such as the law of conservation of energy—are seriously strained. The distances involved are simply too large.
- Communication with inanimate things, plants, animals, and "aliens." This requires unacceptable "human" properties of these entities, not to mention clear violations of the laws of physics.


Maarten Hartman

Gerard 't Hooft

If a physicist is asked to produce an acceptable explanation for the phenomena just mentioned he or she will examine the alternatives and then settle for the most plausible ones. What are these alternatives? I list them in order of increasing probability.

*1. Hitherto unknown physical phenomena, implying paranormal transfer of information.*

As I stated already, we don't know everything about physics or the universe. However, the Standard Model for elementary particles shows only information carriers that are already in use: of these, the electromagnetic spectrum is most suitable in practice, and the others are completely useless for any magical purpose. Note that sound, smell, and sight all rely on chemical and mechanical properties of matter, and these are basically the results of electromagnetic interactions only. Ordinary tissue cannot detect neutrinos, and gravitational waves are too weak. Deviations from the Standard Model are so weak that they have not been detected yet.

To detect weak signals one needs detectors that are very large (arrays of large telescopes, containers with thousands of tons of extremely pure water or gallium), because in physics we have a simple rule: larger detectors can be more sensitive than smaller ones. Amateurs often forget about this rule. An extremely cold detector (close to absolute zero) is also a big help. The human brain is neither large nor cold. The nerves in the human brain (in any animal, in fact) work pretty well, but this reliability in the presence of various disturbances such as thermal noise has an unavoidable price, namely insensitivity to weak signals.

There are other reasons why a physical explanation is unfeasible. The signals we are talking about violate causality, are transmitted over enormous distances, and have strange sources (people in distress). Moreover, they must somehow be coded and decoded and this process has to operate flawlessly. In any radio, any TV set, and any kind of ordinary detector (including the human nervous system for the ordinary senses) there are enormous amounts of specialized circuitry for doing this. This alternative—some undiscovered kind of particle physics, quantum mechanics, or relativity theory—is absurd in the eyes of a physicist.

*2. All phenomena are pure coincidences.*

Coincidences do happen, and if one collects enough of them unsystematically one can get a distorted view of reality. In science one often meets with improbable one-of-a-kind observations. However, a scientist encountering unlikely results can always make more careful experiments or observe over longer periods of time. One then gets better statistics, and nearly always it turns out that the very first "strange" phenomenon is a freak coincidence. Many "skeptics" like to grasp at this straw, but to me that seems too easy. There are too many of these phenomena.

*3. Psychic claimants are liars and charlatans.*

Extreme skeptics like this explanation, and many phenomena may be in this group. The corn graffiti (also known as crop circles) are a case in point. But again, I think it is too easy to stick to this explanation only. Many paranormal claims are made by honest people.

*4. We are dealing with a delicate psychological phenomenon, caused by wishful thinking.*

People often want the impossible, such as contact with dead

loved ones. Or they desperately want a superior (supernatural or extraterrestrial) power to set right various injustices or offer guidance. A little innocent lie is needed, which they readily admit and subsequently forget. Their wishful thinking corrected the imperfections of life as it is, and they did so without consciously realizing what happened. In the back of their minds their sense of justice and their love of truth go into a fight, but the battle is a short one, and justice wins—by a big margin. Their self-respect then erases the memory of truth.

Of course, I'm a physicist and not a psychologist. My rendition of what goes on in the mind of someone who claims a paranormal experience is probably flawed, but it is meant as a general idea, and a stepping stone to the last alternative.

*5. People can be tricked by their own brain.*

This view is based on my conviction that the human brain is basically a kind of computer. What happens in a computer when new data are stored? These data receive a time stamp. A clever programmer can simply change that time stamp. Compared with events that are registered later, those antedated data might appear to be a "paranormal signal." In other words, the "memory" of a computer can be sabotaged. The same kind of thing can happen to people. One can have a shocking experience, and then remember with "absolute certainty" that one has dreamt the incident the week before. How can one be sure? How can one know that the brain hasn't antedated the memory? Sometimes the brain can have an interest in making such errors. This is the essence of the previous explanation. Our memory is far from infallible, and I think that an important class of paranormal "events" are the result of the brain antedating memories or maybe even fabricating memories that have no relation to reality. The individual to which this happens has no way of separating the true from the false memories.

Let us once more examine the reports of paranormal events. What are their differences, and what are their similarities?

• The claims imply many radically different physical natures of signals. One signal goes back in time, the other is sent by a UFO, the third from a dead person (or his immaterial soul), the fourth from a hand-held object, and so on. If the first of our five alternatives would hold, we would need just as many radically different physical theories.

• The claims are often associated with strong emotions. Psychics are frequently consulted by people in deep distress with nowhere else to go. This points to explanations four and five. Strong emotions can blind people to a discomforting reality, and the psychic offers a kind of justice. Or our brains do something very convenient: reality is blocked out and replaced by better thoughts. Evolutionary biologists and psychologists won't have many problems explaining how and why our brains make such "switchboard errors."

Scientists are often accused of not being open enough to "paranormal phenomena." "As scientists" they should be open to them, it is said. But it wouldn't be very open-minded if we wouldn't try to fit reported phenomena logically into the web of established physical phenomena and laws of nature. The laws of physics, biology, and psychology point all to the most plausible explanation of them all: paranormal phenomena are in the eye of the beholder. They happen between human ears, not outside of them.

## Note

Gerard 't Hooft's Web site, http://www.phys.uu.nl/~thooft, contains an essay in which he tries to answer the many questions he receives about his views on the paranormal. This essay was expanded especially for a skeptical audience, and this English version appears in print here for the first time. The author doesn't pretend any originality. It is just the Standard Model of the skeptical argument, which has been current for a long time. (The editor thanks Jan Willem Nienhuys for facilitating this article and translating it from the original for the SKEPTICAL INQUIRER in cooperation with Professor 't Hooft.) □

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# *MAD MESSIAHS*

*Continued from page 13*

cable network, and has a central aim of persuading Jews who have strayed from the faith to return to the fold. The outreach is said to take in some $100 million a year in contributions.

Rabbi Schneerson was much loved and admired by all New York City Jews even though conservative and reform Jews considered his messianic claims something of a joke. He was a magnetic preacher, and every Saturday thousands of admirers would jam into his Brooklyn synagogue to hear him. Every sermon was printed and faxed to his followers everywhere. A collection of his speeches runs to more than thirty volumes.

In 1993 the Schneerson mania in Israel and in New York City had not abated. A Brooklyn group called The International Campaign to Bring Moshiach [Messiah] took a full-page ad in the *New York Times* (Sunday, August 29). It featured a photograph of Schneerson surrounded in large print by the following message:

> The revered leader of world Jewry, Rabbi Menachem M. Schneerson, the Lubavicher Rebbe Shlita, issued a call that the time of our redemption has arrived, and Moshiach is on his way.
>
> The Rebbe, furthermore, stressed that he is saying this as a prophecy and asks all mankind to prepare themselves for the great day of redemption, with a personal commitment to increase in charity and good deeds.
>
> Over the years the Rebbe has inspired us, with his leadership, scholarship and prophesies time and time again. Now the Rebbe is telling us, as a prophecy, that Moshiach is on his way.
>
> Let us heed the Rebbe's call and let us all prepare for our own benefit, for that greatest of days, the ultimate purpose of G-d's creation.

I assume that the hyphen in "God" was intended to reflect the absence of vowels in Hebrew writing.

The Habad belief that Schneerson was the Messiah vanished after the rabbi died, following a stroke in 1994. He was 92. Thousands of wailing mourners from all over the world attended his funeral at the Lubevitch international headquarters in Brooklyn. □

# Efficacy of Prayer

## *A Critical Examination of Claims*

*The "landmark study" of Byrd and the recent confirmation attempt by Harris et al., both claiming therapeutic benefits of intercessory prayer, are shown to be invalid. One was improperly designed, the other fallaciously analyzed—and the two contradict each other.*

IRWIN TESSMAN and JACK TESSMAN

The therapeutic power of prayer is a recurring theme among many proponents of alternative medicine. One can imagine a natural explanation for the alleged benefits: a psychological boost from the belief that a supernatural power is on your side. But what if you are unaware that people are praying for you? Such intercessory prayers could only work through a supernatural agency.

Investigating the efficacy of intercessory prayer was given scientific legitimacy by Francis Galton, the father of biometry and a central figure in the founding of modern statistical analysis. In classic memoirs, Galton (1872, 1883) argued that regardless of how the prayers "may be supposed to operate," the "efficacy of prayer . . . is a perfectly appropriate and

legitimate subject of scientific inquiry" because it can be tested statistically, as he then demonstrated.[1]

## A Landmark Study

A celebrated study performed at San Francisco General Hospital by Randolph C. Byrd reported that patients in a cardiac care unit received statistically significant benefits from intercessory prayers (Byrd 1988). That study has attained special status within the alternative medicine community and has been reprinted as a "landmark study" (Byrd 1997).

In the same skeptical spirit that motivates one to seek the flaw in the design of a perpetual motion machine, we have examined Byrd's study, as others have done (Posner 1990; Sloan et al. 1999; Witmer and Zimmerman 1991), to seek a natural explanation to rival the supernatural one.

Archives of Internal Medicine

ORIGINAL INVESTIGATION

A Randomized, Controlled Trial of the Effects of Remote, Intercessory Prayer on Outcomes in Patients Admitted to the Coronary Care Unit

William S. Harris, PhD; Manohar Gowda, MD; Jerry W. Kolb, MDiv; Christopher P. Strychacz PhD; James L. Vacek, MD; Philip G. Jones, MS; Alan Forker, MD; James H. O'Keefe, MD; Ben D. McCallister, MD

Tuesday, October 26

Prayed-for patients fare better in study

Positive Therapeutic Effects of Intercessory Prayer in a Coronary Care Unit Population

RANDOLPH C. BYRD, MD, San Francisco, Calif

We believe a serious flaw exists in his critical Table 3, a flaw that raises doubts about the table's validity. That table reports the overall outcome for patients admitted to the cardiac care unit. Upon admission, they were entered randomly into one of two groups: an intercessory prayer group or a control group (192 and 201 patients). The outcome was recorded as *good*, *intermediate*, or *bad*.[2] Byrd found that compared to the control group, the prayer group had an excess of good outcomes and a deficit of bad outcomes, a significant difference in favor of the prayer group with $P < 0.01$ (Byrd's Table 3). The study was necessarily intended to be double blind. Byrd writes: "The patients, the staff and doctors in the unit, and I remained 'blinded' throughout the study."

Unfortunately, that was not the case at a critical point. Byrd's Table 3, which might best have been constructed by a panel of "blinded" doctors, was constructed by Byrd alone. But it was done in response to criticism of an earlier version of his manuscript, the writing of which had already required that the code be broken. Thus Byrd was no longer blinded when he determined the answer to the key question of which did better, the intercessory prayer group or the control group (Byrd, personal communication).

Because the table was apparently constructed from computer-stored data using objectively stated criteria that did not involve Byrd in any personal evaluation of individual cases, the lack of blinding might have had no effect. Although blind evaluation is clearly preferable, the use of an unblinded analysis could be defended were it completely computer generated. However, the criteria he chose for evaluating the patients' outcomes were formulated after the data were collected and when Byrd was unblinded. That is an unreliable approach. The criteria should have been selected before the start of the study.

The claim of blindedness is erroneous in yet another respect (one aspect of which has already been mentioned [Witmer and Zimmerman 1991]). In his acknowledgments, Byrd thanks "Mrs. Janet Greene for her dedication to this study," but without any elaboration of her role. In a later publication (Byrd with Sherrill 1995) we learn that Janet Greene was hired "... to be our coordinator. ... Janet entered names of all the volunteer patients into a computer that randomly divided them into two groups. ... half of the patients—only Janet knew who they were—were prayed for daily by our intercessors. ... She kept detailed records of all patients in both groups." Thus the very coordinator of the study was completely unblinded. Once patients were assigned to one of the two groups, Greene should have had no further contact with the hospital.[3]

Byrd's evidence for supernatural intervention, if true, would arguably be one of the most remarkable scientific demonstrations of the last millennium. To be credible, however, it requires, among other things (Posner 1990; Sloan et al. 1999; Witmer and Zimmerman 1991), considerably more attention to strict blindedness. In the absence of that credibility, its status, not to mention the "landmark" label, is highly dubious.

## A Confirmation Attempt

Recently, another prayer study, broadly based on Byrd's (and the subject of numerous news reports in October and November 1999), examined 990 patients admitted to a coro-

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nary care unit (Harris et al. 1999).[4] The authors scored the effects of intercessory prayer on the occurrence of thirty-four adverse conditions (Harris's Table 3).[5] These are similar to the twenty-six conditions scored by Byrd (his Table 2).

Their general approach to scoring the efficacy of intercessory prayer is summarized as follows. "Since prayer was offered for a *speedy recovery* with *no complications* [our italics], it was anticipated that the effect of prayer was unlikely to be evident in any specific clinical outcome category (e.g., the need for antibiotics, the development of pneumonia, or the extension of infarction), but would only be seen in some type of global score."

Let us therefore look first at the speed of recovery. The length of stay in the coronary care unit decreased 9 percent in the prayer group, but with $P = 0.28$;[6] the length of hospital stay increased by 9 percent in the prayer group, but with $P = 0.41$ (their Table 4). Thus, by either measure the large $P$ values indicate that the results are quite consistent with a null effect; thus there is no evidence that intercessory prayer confers any benefit (or harm) in speed of recovery.

Next we examine the results for two types of global scores. One is the Mid America Heart Institute–Cardiac Care Unit (MAHI-CCU) weighted score (their Table 4)[7] for the thirty-four adverse conditions. They call this score the "primary predefined end point" of their study. It shows an 11 percent advantage to the intercessory prayer group with $P = 0.04$.

Another type of global score arises from an evaluation of overall outcomes judged by a blinded panel to be either good, intermediate, or bad, each based on Byrd's criteria.[2] Whereas Byrd found a significant difference ($P < 0.01$) in *good* and *bad* outcomes in favor of the prayer group, Harris et al., using the same criteria, find no significant difference ($P = 0.29$, Harris's Table 5). Thus, not only do these results of Harris et al. fail to confirm the significant differences found by Byrd, they constitute a second set of results (the first being on speed of recovery) that shows no significant effects of intercessory prayer.

Thus Harris et al. make three major tests of the efficacy of intercessory prayer: speed of recovery scores (Table 4), MAHI-CCU global scores (Table 4), and outcome scores (Table 5). On the basis of just the MAHI-CCU scores taken alone with its barely significant $P = 0.04$ value, Harris et al. conclude there is a beneficial effect of intercessory prayer.

This argument is simply fallacious: where there are multiple tests it is incorrect to single out just one, ignoring others with large $P$ values that indicate no significant differences between the groups tested. For example, if the three tests were completely independent, the probability that at least one of the three would show $P = 0.04$ purely by chance would be $1 - 0.96^3 \approx 0.12$, which is well above the conventional maximum value of 0.05 for significance. Though the tests are not independent, it is clear that the overall probability of observing that just one of these three tests favors intercessory prayer with $P$ as low as 0.04 is well explained by pure chance.[8]

## Conclusions

The tests of Harris et al., taken in their entirety, fail to show any significant benefit of intercessory prayer, *and* one of the tests directly contradicts Byrd's primary evidence for efficacy (his Table 3) that is the cornerstone of his "landmark study."


## Acknowledgment

We thank Louis J. Cote (Purdue University) for extensive discussion and criticism.


## Notes

1. Galton's retrospective analysis revealed no beneficial effect.

2. Here is how *good* and *bad* scores were achieved. The outcome was scored as *good* if only one of the following occurred: "left heart catheterization; mild unstable angina pectoris of less than six hours' duration; self-limiting ventricular tachycardia within the first seventy-two hours of myocardial infarction; supraventricular tachyarrhythmia; uncomplicated third-degree heart block requiring temporary pacemaker; mild congestive heart failure without pulmonary edema; no complications at all." The outcome was scored as *bad* if there occurred "nonelective cardiac surgery, readmission to the coronary care unit after a myocardial infarction with unstable angina, extension of initial infarction, cerebrovascular accident, cardiopulmonary arrest, need for artificial ventilator, severe congestive heart failure with pulmonary edema and pneumonia, hemodynamic shock due to sepsis or left ventricular failure, death."

3. Byrd might have gone further and designed his study so that no human would know, until the appointed time for breaking the code, which patients were in the test group and which in the control group. If the intercessors needed names for their assigned patients, pseudonyms could have been used without any human knowing to whom the pseudonyms referred. This should present no difficulty to the Judeo-Christian God to whom the intercessors were praying.

4. To help assure blindedness, not even the patients knew they were being studied. The requirement of informed consent was waived, in part, because it was felt that the study posed no known risk to either patient group.

5. The conditions include, for example, the need for antianginal agents, antibiotics, arterial monitor, vasodilation, antiarrhythmics, catheterization, diuretics, a permanent pacemaker, an interventional coronary procedure, intubation/ventilation, major surgery, and twenty-two others.

6. We calculate $P = 0.36$. Reminder: $P$ is the probability of this result occurring purely by chance. Conventionally, a value of $P$ greater than 0.05 attributes no statistical significance to the result.

7. An example of their scoring system: if "a patient developed unstable angina (1 point), was treated with antianginal agents (1 point), was sent for heart catheterization (1 point), underwent unsuccessful revascularization by percutaneous transluminal coronary angioplasty (3 points), and went on to coronary artery bypass graft surgery (4 points), his weighted MAHI-CCU score would be 10."

8. It is the responsibility of Harris et al. to calculate the overall $P$ value.

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# Can We Tell When Someone Is Staring at Us?

*A common belief is that people can tell when someone is staring at them, and some parapsychologists contend this is a form of distant mental influence. To test this phenomenon, the author carried out two demonstrations, one with forty people in a public area, the other with fifty students in a controlled setting.*

ROBERT A. BAKER

According to parapsychologists, a commonly reported form of distant mental influence on human beings is "the feeling of being stared at," which is closely related, historically, to the notion of the "evil eye." Considerable folklore endorses the idea that gazing at someone carries special powers, favors, or influence. Folklore aside, contemporary opinion polls confirm that the feeling of being stared at is known in all cultures (Radin 1997).

A typical occurrence is that of a woman eating alone at a diner who suddenly becomes agitated. Then the hair on the back of her neck raises and she gets the feeling that someone is watching her—someone behind her. She turns and, sure enough, a young woman is staring directly at her. This type

of situation is reported over and over and raises the question: Can a starer's intense focus affect the human nervous system?

According to some parapsychologists it not only can but does, and they insist that it has been confirmed in several laboratory studies, (e.g., Braud, Shafer, and Andrews 1993a; Braud, Shafer, and Andrews 1993b; Schlitz and LaBerge 1994 and 1997; and Peterson 1978). Wiseman, on the other hand, in a series of studies (Wiseman and Smith 1994; Wiseman, Smith, Freedman, Wasserman, and Hurst 1995) as well as a study carried out with Schlitz (Wiseman and Schlitz 1997) found no evidence of psychic functioning. In fact, psi (extrasensory perception) proponents are the only ones who seem to obtain evidence for psi while skeptics do not and, as Wiseman notes (Wiseman and Schlitz 1997), this fact may provide strong support for "the experimenter effect" (Palmer 1989), i.e., the experimenter somehow controls the outcome of the study. Such an effect, however, would be as mysterious—if not more so—than the alleged "staring effect" itself. In another context Wiseman (1999) suggests that the positive results might well represent a "file drawer" effect, i.e., people who failed to obtain impressive positive results simply filed the study away and didn't bother to report it. Nevertheless, Blackmore, who is a severe critic of parapsychology in general (Blackmore 1996), has stated that most contemporary parapsychologists believe this phenomena to be true and offer it as valid proof of psi.

Unquestionably the most vocal supporter of this claim is the British biologist Rupert Sheldrake who, in chapter four of his book *Seven Experiments That Could Change the World: A Do-It-Yourself Guide To Revolutionary Science* (Riverhead Books, New York, 1995), argues that not only do our minds "extend beyond the body" but also suggests, "If our minds reach out and 'touch' what we are looking at then we may affect what we look at just by looking at it. If we look at another person, for example, we may *affect* him or her by doing so" (107). Sheldrake, moreover, insists that the sense of being stared at is not only very "well known" but in informal surveys in both Europe and America, "I have found that about 80 percent of the people I have asked claimed to have experienced it themselves." Sheldrake also notes it is accepted as a premise in countless works of fiction and it plays an important part in the relationship of people with animals and their pets.

It is, therefore, of considerable importance and significance to determine if such "mental influence," independent of other possible material means of human-to-human communication, does exist.

## Demonstration One

### Methods and Procedures

Despite the fact that parapsychologists maintain people are sensitive to being stared at and are physically affected under nor-

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mal social conditions, most of the research in this area has not involved asking people if they're aware of being stared at but has, curiously, monitored subtle, subthreshold physiological differences between staring and nonstaring periods. Such staring effects—if they exist—that are so subtle that they can only be detected at subthreshold levels must be very weak and insignificant indeed. Measuring conscious and overt responses, as Sheldrake has done (1995) seems to be a simpler and more direct way to tell if people are aware they're being stared at. This, after all, is the claim usually made by believers in psi.

Rather than carrying out a rigidly controlled laboratory experiment, the author decided to test this claim under ordinary, real-life conditions in the form of a demonstration. The author was convinced at the outset that people who are cognitively focused (i.e., mentally engrossed in an activity), will never, under normal circumstances, attend to such a weak, nonintrusive, nonmaterial, competing sensation as that of "being stared at." Showing that people are not aware they're being stared at is a demonstration of "common sense," not an experiment with an unpredictable outcome. To carry out this demonstration the author, on several occasions over a two-month period, took up a physical position no closer than five feet and no farther away than twenty feet behind forty individuals—twenty-one women and nineteen men (of the forty, twenty-two were University of Kentucky students and eighteen were Lexington, Kentucky, citizens)—and for a period of time between five and fifteen minutes stared intently at the back of each individual's head. Both the viewing distance and the time spent staring varied because of the situational requirements for each subject and the conditions prevailing at the time of the observations. The mean age of those who were stared at was 29.5 years.

Considerable care was taken with each subject to ensure that the starer was not noticed by the person being stared at when the starer took up his physical position behind the subject. Care was also taken to ensure that the subject was not physically aware of the starer's presence during the observation period. Further care was taken to ensure that no third party was aware of the author's staring behavior and then communicated this to the person being stared at during the staring period. The author made sure his staring behavior went undetected not only by the subject but by other people in the environment. No communication between the subject and any other "watchers" took place during the staring sessions. When the subjects completed the activities in which they were engaged, they were approached and questioned. All subjects were seated during the time they were observed. No subject was ever interrupted by the experimenter during the staring period, and the staring period was continued until the subject clearly shifted his or her attention to another task. For example, those subjects stared at while they were eating or drinking were not approached and questioned until they had left their table and had moved toward the cashier or exit.

Seven of the subjects were stared at while they were eating or drinking. Nine subjects were observed while they were reading or studying at the University library or one of the Lexington city libraries. Eight subjects were observed while they were watching TV and the remaining fourteen were observed while they were working at a computer video terminal. Results from two other subjects were discarded.

During each of the forty observation periods the experimenter tried to maintain a steady and unrelenting gaze at the subject's back and head and to ensure that the experimenter's presence and position went undetected during the period of observation.

Following each observation period the experimenter approached the subject, introduced himself, handed the subject his business card, explained the purpose of the investigation and asked them to check and sign a prepared response sheet (figure 1). This response sheet asked them to indicate whether or not they were aware of being stared at and to give their permission to use their results. The mean time of all the subjects being stared at was 8.6 minutes (standard deviation 2.7) and the mean distance behind the subjects was approximately twelve feet.

## Results

Thirty-five out of the forty subjects who were stared at and then interrogated reported they were "totally unaware that anyone was looking at me." Three subjects reported during the period that they did feel as if something was "wrong," "odd or

DATE: _____ TIME: _____

PLACE: _____ OBSERVER: _____

PLEASE CHECK THE ONE STATEMENT BELOW THAT IS THE MOST ACCURATE:

_____ During the last 5 minutes I was definitely aware that I was being observed and being stared at.

_____ During the last 5 minutes I felt strange, odd, and definitely different, i.e., I felt something was wrong, that is, not normal.

_____ During the last 5 minutes I was totally unaware that anyone was looking at me.

SIGNED_____

NAME_____

ADDRESS_____

PHONE NUMBER_____

NOTE: By signing above I hereby give my consent to having my results included in this psychological study.

During the observational period record the number of times S turned around, looked back, looked sideways, looked at either of the observers, etc.:

_____

_____

For further information call: Dr. Robert Baker or Video Hits.

Figure 1. 'Sense of being stared at' experiment response sheet.

unusual," but they were unable to report where the experimenter was seated during the staring period. Two subjects reported that they were habitually being observed and routinely were stared at by other people. One of these two subjects thought she was constantly being "spied on" by the FBI and/or "aliens from outer space." The other stated that since he "had extrasensory ability and always knew what other people were thinking and doing," he was well aware of my presence. Neither of these subjects were able to correctly designate the experimenter's position during the observation period, increasing the likelihood they were neither aware of his presence nor of his staring behavior. Therefore the results from these two were discarded. It is also of interest to note that the three subjects reporting a sense of anxiety were not totally engrossed in what they were doing during the observation period. All three stood up, looked around, shifted their position several times, and appeared to be momentarily distracted on a number of occasions. None, however, stared at the experimenter or took anything other than casual notice of his presence. No eye contact between the experimenter and any of the subjects was ever made during the observation periods.

Figure 2. View of subject at table with digital clock. This is what the experimenter saw when staring at the subjects through the one-way mirror.

For the thirty-five subjects who reported that they were unaware of being stared at it is important to stress the fact *that each of these subjects was totally involved and attentive to the activity they were engaged and focused on. They were seldom if ever distracted by surrounding activities during the period of observation.*

## Demonstration Two

### Methods And Procedures

Because of the possibility that subjects, when cognitively focused on an important activity—like eating or drinking, or reading and studying, or problem solving—would not or could not attend to weaker or more subtle stimulation from psi or other paranormal sources such as "feelings of being stared at," a second study was carried out. If subjects were told that over a fixed time-period they would be stared at on a number of separate occasions, they might well be able to detect when they are being observed. Since they are focused on the problem of "being stared at" rather than competing activities their ability to detect stares should be maximized. Some parapsychologists (and Sheldrake in particular) argue that under such conditions the subjects should do well. Sheldrake, in fact, reports positive results from his own similar experiments but notes that "most people do not perform very impressively under artificial conditions" (Sheldrake 1995). Sheldrake also makes a strong case for studies of this sort and argues that this is one of the "big scientific questions" that does not require a "big science approach" i.e., millions of dollars, large laboratories, and Nobel Prize-winning researchers in order to obtain valid and reliable answers.

To test this hypothesis fifty University of Kentucky students, thirty-six women and fourteen men from the Freshman Introduction To Psychology Course, served as volunteer subjects. Each of the fifty volunteers served both as an experimenter, i.e., starer; and as a subject, i.e., the person being stared at.

Two adjoining, soundproofed rooms connected by a one-way vision window in the psychology building at the University of Kentucky were used for the observations. Working in pairs, the subject being stared at was seated at a table in the observation room with his or her back to the one-way mirror. A digital clock with large hour and minute numbers was placed at one end of the table with the subjects at the other end. The clock was located so that it could be seen from the observation side, i.e., the other room, by the two observers doing the staring, (the author experimenter and the student experimenter) as well as by the person being stared at (figure 2).

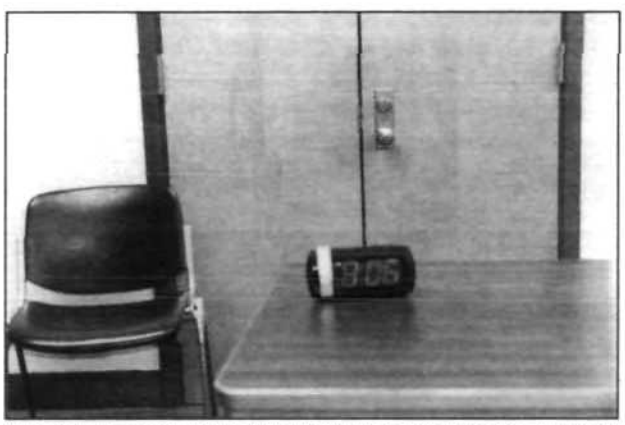


Figure 3. This is the view of the digital clock that the experimenters saw through the one-way mirror during those time intervals in which the subjects were not being stared at.

On the observer side of the window the two doing the staring were seated at a table in a position where the clock was clearly seen but the view of the subject was blocked by a small cloth partition. To stare at the subjects both the experimenter and the student had to stand up and look over this partition and stare at the back of the subject at the required time for the full one-minute interval (figures 2 and 3).

Before each twenty-minute staring session the subject was furnished with a time sheet on which they filled in their name, date, and time of the experimental staring session. Subjects were told to write "yes" on the minute-by-minute time line whenever they believed someone was staring at them. Next, they entered the time shown on the digital clock after their "yeses." The subjects also marked his or her degree

of certainty that they were being observed in the appropriate column on the right hand side of the time sheet. They were also informed that they could check only five "yeses" in the first column—since no one would be stared at more than five times, i.e., more than five minutes during the twenty-minute session. If, however, the subject filled in five lines before the twenty minutes were exhausted but felt that during the last few minutes of the session they were more certain they were being stared at, they were allowed to cross out earlier "yeses" and fill in the later minutes with a "yes" of a higher degree of certainty (figure 4).

On the observer side of the mirror the experimenter and the student experimenter used an identical twenty-minute Experimenter Time Sheet in which the five individual minute observation periods were pre-selected and marked on the experimenter's time sheets. The five one-minute staring periods for each of the fifty student subjects were randomized by putting fifteen white poker chips and five red poker chips in an opaque bowl. After shaking the bowl, for each of the fifty Experimenter Time Sheets the chips were drawn one at a time, with the red chips used to designate the minutes for staring. The only restriction imposed on this method of randomization for the minute staring sessions was that in the event five red chips were drawn successively this draw was rejected and and the randomizing procedure was started afresh.[1] All subjects were informed of these randomizing procedures and all questions regarding exactly what they were supposed to do and the precise requirements of their task were answered before each twenty-minute period began (figure 5).

## Results

None of the fifty subjects were able to accurately guess all of the times that they were being stared at by the two experimenters. Eighteen of the fifty subjects did correctly guess two of the five-minute periods during their twenty-minute session. Seventeen subjects correctly guessed only one of the five-minute sessions and eleven were not able to guess any of the five. Only four of the subjects correctly guessed three of the five correctly. The mean accuracy for the group of fifty was 1.24 with an standard deviation of .91. A score of 1.25 would be expected by chance alone for each twenty minute trial, i.e., 1/4×5 or 1.25. With this outcome the usual statistical tests are irrelevant; there's no way that these particular results could ever approach statistical significance.

Since the four subjects who exceeded chance by correctly guessing three out of the five one-minute periods in which they were being stared at might well be "psi stars" or "psychically

SUBJECT'S NAME: Kim Stewart EXPERIMENTER'S NAME: Baker and R. Smith

DATE & TIME: 18 DEC 1998 — 0745 PM

| TIME (In minutes from start at 0800 PM) | | NOT SURE | ALMOST SURE | CERTAIN |
|---|---|---|---|---|
| 0801 | 1 & 2 | | | |
| 0802 | 2 & 3 | | | |
| 0803 | 3 & 4 | | | |
| 0804 | 4 & 5 | | | |
| | 5 & 6 YES — 0805 | ✔ | | |
| 0806 | 6 & 7 | | | |
| 0807 | 7 & 8 | | | |
| 0808 | 8 & 9 | | | |
| 0809 | 9 & 10 | | | |
| | 10 & 11 YES — 0810 | ✔ | | |
| 0811 | 11 & 12 | | | |
| | 12 & 13 YES — 0812 | | | |
| 0813 | 13 & 14 | | | |
| 0814 | 14 & 15 | | | |
| | 15 & 16 YES — 0815 | | ✔ | |
| 0816 | 16 & 17 | | | |
| 0817 | 17 & 18 | | | |
| 0818 | 18 & 19 | | | |
| | 19 & 20 YES — 0819 | ✔ | | |
| 0820 | 20 & 21 | | | |

DIRECTIONS: Write "YES" on the two-minutes line whenever you believe someone is staring at you. Next enter the time shown on the digital clock after your "YES." Then check your degree of certainty in the appropriate column on the right. Remember you can check only FIVE (5) "YESes" in the first column—since no one will be stared at more than five times for two minutes each during the 20-minute experimental period.

Figure 4. Sample of subject's time sheet used to guess times they were being stared at.

gifted," each of these four subjects was retested under the same experimental conditions three separate times. None of the four accurately identified more than one one-minute period in which they were being stared at. The mean retest score for all three retest sessions for the four "stars" was .025 for each session—less than chance. The mean of their original score plus the three retest scores was used in the distribution.

## Discussions of the Results of Both Studies

The results from both studies provide little support for those parapsychologists who insist that people, somehow, can sense when they are being stared at. In the first study when the subjects were questioned at the end of the staring period, only two expressed any confidence that "they were aware of or could sense someone was looking at them." Even for these two the accuracy of their claims is suspect. Similarly, in the second study only nineteen of the fifty subjects checked the "certain" level of confidence at any minute for any of their guesses. Of the total forty-two guesses of "certain" made by the nineteen subjects only four were correct, i.e., thirty-eight of the subjects' feelings of certainty that they were being stared at were in error. This is an overall accuracy level of .09. Clearly, even when subjects "know" they are being observed they are never sure exactly when.

These results are not surprising when it is remembered that most industrial and business security systems are based on the premise that the cashiers, dealers, croupiers, et. al., are *not* aware of exactly when they are under surveillance, i.e., being stared at by security personnel from one-way mirrors or monitoring cameras. The TV series *Caught On Tape* (Real Life Productions) is also based on the fact that people frequently commit crimes when they assume no one is looking. CBS's very popular *Candid Camera* TV show also assumes people are not aware of the fact that others are looking at them.

Why Braud and the other parapsychologists resorted to the use of indirect physiological measures, e.g., electrodermal activity, rather than more direct, above-threshold methods is puzzling. Opportunities for the play of bias, i.e., "the experimenter effect," are maximized in the notoriously unreliable recording and reporting of these highly sensitive and quixotic subthreshold measures. In fact, in a recent study using electrodermal measures (Wiseman and Schlitz 1997), Wiseman, a skeptic, found no evidence of psi whereas Schlitz, a believer, found positive and significant effects.

Accordingly, a simpler, more direct approach to the study of such alleged effects seemed both more reasonable and more reliable, especially since the claim that people know they're being stared at is an "above threshold" phenomenon.

Sheldrake's contention that such studies as the two reported here cost very little to carry out, can be done by most anyone without special training—including amateurs—and can yet provide good scientific answers to big questions are points well taken. A recent example of what Sheldrake calls "small science" is the work of eleven-year-old Emily Rosa and her study of Therapeutic Touch (Sarner

**EXPERIMENTERS' TIME SHEET (20 MINUTES)**

EXPERIMENTER'S NAME: Baker and R. Smith

SUBJECT'S NAME: Kim Stewart

DATE & TIME: 18 DEC 1998 — 0745 PM

TIME (In minutes from start at 0800 PM)

| | |
|---|---|
| 1 & 2 | |
| 2 & 3 | |
| 3 & 4 | X 0803 |
| 4 & 5 | |
| 5 & 6 | |
| 6 & 7 | X 0806 |
| 7 & 8 | |
| 8 & 9 | |
| 9 & 10 | |
| 10 & 11 | X 0810 |
| 11 & 12 | X 0811 |
| 12 & 13 | |
| 13 & 14 | |
| 14 & 15 | |
| 15 & 16 | |
| 16 & 17 | X 0816 |
| 17 & 18 | |
| 18 & 19 | |
| 19 & 20 | |
| 20 & 21 | |

Figure 5. Sample of time sheet used by the experimenters to determine exactly when subject would be stared at. "X" indicates the five specific one-minute periods during which this particular subject was stared at.

1998). Because two studies reported here are also good examples of small science, the author strongly recommends that other interested skeptics replicate these studies. The second study does not require connected rooms with a one-way mirror. A cardboard partition with two holes—one allowing the experimenter to see only the digital clock and the second allowing the experimenter to see both the clock and the person being observed—would serve adequately. Both the experimenter and the subjects could carry out such a study in a single room with the subjects at one end and the observer at the other. In the present study when subjects were asked not to turn around or stare at the one-way mirror all of them complied. In the first study, obviously no special equipment of any sort is required.

A note of caution is in order to those who would replicate the first demonstration. As noted earlier, two subjects, once they learned that the experimenter was an investigator of paranormal phenomena, did their best to persuade the experimenter that they were special people with special gifts badly in need of scientific attention. This behavior is not unusual. Many ordinary individuals desire attention and publicity and will do anything to get it. The opportunity to establish themselves as psychically gifted and in possession of paranormal powers and, therefore, worthy of further study is a chance they find difficult to pass up.

## Summary and Conclusions

Parapsychologists claim man's ability to know when he is being stared at has existed since the time of primitive man and served, in those days, to warn him of impending danger and attack from savage beasts. They also believe this ability still exists in modern men and women today. Skeptics deny this claim and believe it is nothing more than superstition and/or a response to subtle signals from the environment that are not strong enough to let us know exactly what caused them. For example, if we are in a very dark room and we suddenly sense the presence of another person—even though we do not see or hear him—we may know he is there because of the person's shaving lotion, movement of air currents in the room, body heat, etc. In other words if we are warned of another's presence, it is likely due to subtle physical cues in the environment that we normally do not attend to—not to any so-called "psychic" or paranormal ability!

To determine if people can tell when they are being stared at, two demonstrations were completed. In the first, forty individuals were stared at for an average time of 8.6 minutes while they were eating, reading, or watching a computer screen or television. When they finished they were asked if they were aware they were being stared at. Of the forty a total of thirty-five reported they were "totally unaware that anyone was looking at them." For the other five there is good reason to believe they also were not aware they were being viewed. In the second demonstration fifty students sat at a table in front of a one-way mirror and were observed by two experimenters, one minute at a time, five times during a twenty-minute observation period. The students' task was to try to guess when they were being stared at and report their degree of certainty. None of the fifty were able to correctly guess when they were being stared at. The mean accuracy score for the group was 1.24; the chance score for guessing was 1.25 out of a total of five guesses.

Despite the parapsychologists' contentions, unless replications of these two studies prove otherwise, it is prudent to conclude that people *cannot* tell when they are being stared at. If experimental purists question either the validity or the reliability of the outcome of these two demonstrations, I suggest they repeat them and see for themselves. If people somehow know they are being stared at—but only at a subthreshold level (which at the moment is unproven and only speculative), this "fact" is of theoretical value only and is far too weak, and unreliable to be of any practical use to modern man.


## Acknowledgments

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## Note

1. This is a simple, quick, and legitimate way to randomize such a presentation. Even if the series were biased, subjects would still be expected to detect the stares when they occurred.

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# Assessing the Quality of Medical Web Sites

*Quackery and misinformation on the Internet may become a matter of life and death. As a growing number of patients and health professionals consult medical Web resources, concerns have been raised about their quality and reliability. The free flow of information inevitably brings such difficulties.*

RAGNAR LEVI

Patients, health professionals, and health policymakers need reliable medical knowledge as a basis for their decisions. Patients need to know when to seek help, what relevant questions to ask, what treatment alternatives there are, and why they should follow caregivers' advice. Health professionals need to keep up to date with the scientific frontier in order to suggest the best available diagnostic and treatment methods. Policymakers need a solid basis for guideline development and organizational decisions.

All this information is available on the World Wide Web today. According to one estimate (Eysenbach et al. 1999), there were 100,000 medical Web sites in 1999. It has been noted that many provide misleading or fraudulent reporting

that could be detrimental, e.g., false claims about treatment effects or disproportionate alarms about health risks. For example, product marketing is not restricted to obvious advertisements, but may appear in journalistic or scientific formats. So while a lot of useful medical information can be found, there is also a considerable amount of misinformation which could do more harm than good.

Misinformation is not only a matter of quackery and fraud, but also of false or misleading scientific results. The distinction between high and low scientific quality, highlighted by the current international quest for Evidence-Based Medicine (Sackett 1997), shows that even seemingly trustworthy, peer-reviewed scientific results must be interpreted with the utmost caution. For example, the choice of research methodology and study design may be inappropriate, leading to inaccurate conclusions. Science cannot be blindly trusted.

The questionable accuracy of some information on the Web has been pointed out repeatedly by professional groups (Gustafson et al. 1999), by individual authors (see Uretsky 1996; Bower 1996; Larkin 1999), and by organizations such as the U.S. Federal Trade Commission (Federal Trade Commission 1999), echoed by the news media (Brody 1999; Anonymous 1999a; Anonymous 1999b). While a recent user survey indicated that some Internet users are concerned about the quality of medical information on the Web (Health on the Net Foundation 1999), health professionals tended to be more concerned about quality than lay users. One third of lay users in the sample expressed no opinion on the question of improving information quality (ibid). Although the survey could not ensure a representative sample, the authors considered the latter finding a matter of concern, considering the large quantity of dubious or downright misleading health care information currently on the Web.

There is some empirical support for these concerns. For example, in a systematic review of Web-based advice on managing fever in children at home, only four of forty-one Web sites reviewed offered recommendations that were completely consistent with established guidelines in the medical community (Impicciatore et al. 1997). One Web site that has received harsh criticism in scientific medical journals (De Bousingen 1996; Nigel 1997; De Bousingen 1997) as well as in public media belongs to "cancer healer" Ryke Geerd Hamer (http://www.geocities.com/HotSprings/3374/index.htm).

Some Web services are dedicated to finding and listing poor quality Web sites that contribute to misinformation, or even health fraud and quackery. For example, Dr. Stephen Barrett hosts a Web site called Quackwatch, providing a long list of cases of questionable phenomena on and off the Internet (http://www.quackwatch.com). This site defines quackery as "anything involving overpromotion in the field of health."

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## Medical Web Sites—By Whom, For Whom?

The Internet is often referred to as a global network, which is only partly true. Although the exact number and geographical distribution of users worldwide are unknown, it has been estimated that more than half are located in North America (NUA 1999). In many countries, only a small fraction of the population have access to computers. It has benn estimated that in developing countries, only 0.05 percent of the public have access to the Internet (United Nations Development Program 1999). Moreover, in developed parts of the world, it is not necessarily those most concerned by health messages communicated on the Web who have the greatest Internet access. Nor is it necessarily those who produce the most reliable information that achieve the greatest visibility.

Web sites offering medical information are used and produced by many groups, including health care providers and consumers, professional organizations, consumer organizations and other interest groups, researchers, educational institutions, health insurers, governmental agencies and other health authorities, health organizations, news media, scientific journals, libraries, database hosts and other information services, and pharmaceutical/medical device companies. Many Web site producers and users lack formal medical training.

Regardless of training, it should be noted that many of these groups, if not all, have vested interests and may produce biased information. For example, financial interests or academic disputes may result in biased or incorrect information.

Is the problem of questionable reliability of health information unique to the Internet? Not really. Unsubstantiated claims for treatment effects are quite common. Health care interventions can be disseminated and accepted as standard treatments even if they are based more on personal opinion than on scientific evidence. However, certain unique features of the Internet make the quality of information in this mass medium particularly shaky (Eysenbach et al. 1998, 1999).

First, unlike traditional media, editorial control at the production stage is not required. Just about anyone with the basic skills and software can publish on the Web. The initial production cost can be low, and the reach can be wide. The information may be true or false, up-to-date or outdated, biased or unbiased, faith or fact. No matter which, the information can—and will—be published for the world to see.

Second, information on the Internet can be retrieved out of context, so that even accurate information could be misleading. A trivial piece of news that is presented without a proper frame of reference or background may seem revolutionary. For example, the fact that a certain form of cancer can be effectively eliminated with surgery may seem persuasive. However, if clinical trials show that surgery indeed removes the tumor, but adds neither years of life nor quality of life, and the latter facts are omitted, the information is misleading.

Furthermore, unlike printed media, Web sites are not always accessed via a "front" page. Information can be viewed without

taking the detour via context pages or "cover" pages containing disclaimers, warnings, etc.

Related to the issue of context is the problem of Web sites that do not state clearly who the source is, and for whom the information is intended—for example whether the material targets a lay or professional audience. Web sites designed for health professionals may not provide the background information necessary to prevent lay users from misunderstanding the information.

The biting reality of the Web is that healers, full of faith, publish their success stories side by side with evidence-based findings by rigorous scientists, full of skepticism. The challenge for Web users is to separate the wheat from the chaff.

## How Can the Information Be Retrieved?

Different search strategies on the Web will yield varying results. *Some strategies will yield more useful information than others,* more relevant to the topic of interest. Depending on the purpose of the search, a user may prefer sites that have been recommended by peers, suggested on link lists, or found using Web-based search tools. Links recommended by a seemingly trustworthy source may be worth more consideration than others. On the other hand, the more personalized the selection, the less comprehensive it is likely to be.

A Web site can be found, for example, through:

1. Suggestions by peers, news media, advertising, etc.
2. Link lists (so-called jump sites), for example on Medscape, HealthWeb, WebMedLit, Uncle, Medical Journal Finder
3. Search tools
   A. regional
   B. global, for example Altavista, Infoseek, HotBot, Excite, Lycos, Northern Light
   C. medical (topic specific), for example Medscape, MedHunt, CliniWeb, MedWeb, Medical World Search, Hardin Meta Directory of Internet Health Resources, Yahoo Health, Medical Matrix
4. Multiple search engines (so called meta-tools), for example Dogpile, Savvysearch, MetaCrawler

## How Can the Retrieved Information Be Evaluated?

There is a wealth of general quality measures related to the source, function, content, and structure of Web sites. A compilation of such criteria is maintained by a site entitled "Information Quality WWW Virtual Library" (http://www.vuw.ac.nz/~agsmith/evaln/evaln.htm). In addition, there are systems to rate the quality of catalogues, browsers, and search engines. For example, some search tools are approved and quality rated by the Argus Clearinghouse, a company of information scientists and librarians offering labeling, navigation, and indexing systems for the Web (http://www.clearinghouse.net).

General criteria for evaluating the quality of medical Web sites are being developed (Kim et al. 1999; Silberg et al. 1997). Some of these quality criteria are quite basic and can easily be applied by the user. For example, when inspecting a Web site, the user should give particular attention to its owners or sponsors and, in particular, their potential conflicts of interest. Names of the authors and their credentials should be clearly presented, and the user should check for references to sources.

Judging other aspects of quality may require special expertise, further research, and consulting databases and other sources. Such aspects include the accuracy and currency of the site's contents and the comprehensiveness of its coverage. Other investigators (e.g., Wyatt 1997) have pointed out that the quality of a Web site also includes the readability of material (measured, for example, by readability indices), the quality of links to other sites, and how effectively the medium is used to communicate the material. Further quality criteria are related to how accessible the site is via search engines, how the site is actually used in practice, and by whom, and what impact the site has on knowledge and behavior, and ultimately on health.

Some of these quality criteria require proper scientific evaluation, and are far beyond the scope of the average health professional user, let alone the typical lay user. For patients, their families, and other lay users, various simple checklists have been designed to give at least a general idea of the quality of a medical Web site. One example is HONcode (http://www.hon.ch/HONcode/HONcode_check.html#HONcodeCheck_site), developed by the Health On the Net Foundation (HON), an international organization, promoting the development and application of information technology in the fields of health and medicine. HON, which describes itself as a nonprofit organization, is based in Geneva, Switzerland. Its simple instrument is designed to answer basic questions like:

- What are the author's credentials?
- When was the site last updated?
- Does this site respect legal requirements of medical information privacy?
- Are claims that relate to treatments, products, or services supported by scientific research results and/or published articles? Or are they based on personal opinion?
- What is the funding and advertisement policy of this site? Is there commercial or noncommercial funding?

Another basic labeling system found on the Web is PICS (Platform for Internet Content Selection). PICS was originally developed to protect children surfing the Web, by filtering out pornography and other offensive material. Information providers who wish to label their own materials could also use PICS to indicate whether the content is appropriate for particular audiences (Fraser et al. 1997).

It has been suggested that specialized labeling services could use an adaptation of PICS (http://www.w3.org/PICS/) to rate medical Web sites (Eysenbach et al. 1998). Through customized browsers, users could then be warned, for example, whenever a Web site is known to contain misleading health information. A prototype version of PICS, called med-PICS (http://www.derma.med.uni-erlangen.de/medpics/index.htm and http://medpics.org/v00-03.htm), has been developed for this purpose.

Med-PICS includes variables like specification of target audience (e.g., children, adult patients, paramedics, medical

students, general practitioners, specialist doctors, researchers), type of source and its trustworthiness, authors' degree of medical/scientific qualification, type of review (peer review, editorial control, readers feedback, none), source of funding (non-profit, minor commercial influence, major commercial influence), and degree of distinction between commercial and other contents.

Another initiative is the U.K. project OMNI (Organizing Medical Networked Information) which aims to provide high quality biomedical resources that have been filtered, evaluated, described, indexed, and classified.

Investigators from OMNI have outlined the following important questions to ask when using an evaluation site or rating scale on the Web (http://omni.ac.uk/agec/iolim96.html #Ref5):

- Does the site clearly state the criteria it uses for the selection and inclusion of resources?
- Is the evaluation site selective in the types of resources included?
- If resources are given a rating (e.g., stars or points), are the criteria for the ratings stated?
- Do resource descriptions/evaluations include the name of the evaluator?
- Is there any indication of the expertise/profession of the evaluator?
- Do resource descriptions/evaluations include the date on which the evaluation was written?
- Is there a mechanism for the regular updating of reviews?
- Are the URLs for resources included in the database regularly checked for changes, either automatically by link-checking software, or by a human?
- Are "dead" links identified and removed promptly?
- Does the site include a search facility?

A whole range of similar instruments rate medical Web sites. However, most of these have been criticized for being incomplete. For example, researchers at McMaster University, Ontario, affiliated with the Canadian Cochrane Centre, have questioned the use of such rating scales (Jadad et al. 1998). Their critique is based on a systematic evaluation of tools, showing that out of forty-seven rating instruments identified, only fourteen provided a description of the criteria behind these ratings, and no more than five gave instructions for using the criteria.

Furthermore, it was observed that the organizations behind these instruments failed to inform users whether ratings are consistent when applied by different raters and whether the instruments actually measure what they claim to be measuring.

Some aspects of quality may be difficult to measure. Dr. Gunter Eysenbach of Erlangen University Hospital, Germany, has pointed out that not only the accuracy of the statements made on a Web site, but also the context in which they are presented, contribute to its quality (Eysenbach et al. 1998).

Apart from the question of how to best rate quality is the issue of who should perform the rating. Eysenbach and coworkers describe centralized and decentralized options. A decentralized system, as suggested by the authors, would mean that doctors, medical societies, and associations would critically appraise Internet information and rate the value and trustworthiness of information by putting electronic evaluative and descriptive "tags" on it. The authors speculate that Web browsers could be customized by the user to filter the information on the basis of these quality tags. The browser would automatically discard low-quality Web resources.

However, while such tools could probably facilitate searching, they would not alter the fact that Web users need to use their own critical thinking. As has been discussed elsewhere (Levi 1999), rating systems, quality filtering, and approval systems can only complement, and will never replace, critical content analysis on the Web users' part. At best, such tools may compare with the peer review system of medical journals, a system that has also been criticized for its shortcomings.

## Pitfalls to Consider

In summary, Web users must always make an independent judgment of the quality of the information posted on Web sites. Many aspects should be considered regarding the clarity, relevance, and reliability of the information.

The following list is in no way comprehensive, and is only intended as a reminder of the many pitfalls related to medical information on the Web.

Factors related to *clarity* may include whether or not:

- the aims of the site are clear, including topic and target group
- the information claimed to be provided is actually provided
- the information is presented in a clear and unambiguous way
- sources of the information are listed
- the date when the information was produced, reported, revised, and posted on the Web are clearly presented
- the producer/owner of the site is clearly identified, including name or title, affiliation, e-mail address, and/or phone number of a contact person to whom users can point out erroneous data, and from whom they can receive further information (i.e., Web master)
- the information is organized in a meaningful way, e.g., reflecting degrees of importance
- the graphic design and layout is functional, e.g., makes the site easy to read and use by logical sequencing

Factors related to *relevance* include whether or not:

- the information presented is adapted to the topic and target group, and is applicable to the target group
- the information is potentially interesting for the target group, e.g., addresses the questions that user might ask, and whether or not recommendations made are realistic and appropriate
- sources of information used to compile the site are clearly presented

Factors related to *reliability* include whether or not:

- the information is well-documented and supported by solid scientific evidence
- the magnitude of treatment effects, health risks, etc., are clearly stated
- the probability of these results being due to chance is assessed, i.e., the statistical significance
- the presence of irrelevant influencing factors (confounders) is assessed and accounted for
- there is a discussion of consistency of the information provided, compared to other relevant sources
- all important health consequences are presented, as opposed to a selection
- the site refers to areas of uncertainty and controversy
- the information is current and updated in a timely manner
- the source is authoritative and without conflict of interest

- the information is balanced and unbiased, or simply reflects a personal point of view (e.g., whether more than one source has been consulted, and whether the information has been externally reviewed, indicating some kind of quality control)

*In 1996, a mailing list called MWM-L (MedWebmaster's List)* hosted an online debate about standards for medical Internet publishing. According to a summary of this discussion (http://pharminfo.com/conference/MWM_faq1.html), many participants desired to see some standards or guidelines established. However, others were concerned that such standards could potentially interfere with the freedom to publish on the Web. This dilemma will probably remain a key issue in future discussions about the quality of medical information on the Web.

## The Web and the Evidence

The considerable amount of medical misinformation currently published on the Web puts high demands on its users. The importance of being able to critically appraise information, in whatever medium it is published, has been stressed by the international movement for Evidence-Based Medicine (EBM) (Levi 1998). Here, the aim is to use the best available scientific evidence as a basis for health care decisions. Some of the EBM tools for judging scientific quality may be adapted and applied to medical Web sites.

A few such instruments and guidelines can be found on the Web, such as in the Core Library for Evidence Based Practice (http://www.shef.ac.uk/~scharr/ir/core.html); at the Centre for Clinical Effectiveness (Monash University, Australia) at Web site (http://www.med.monash.edu.au/publichealth/cce/resources.htm), in the EBM Tool Kit (University of Alberta, Canada at http://www.med.ualberta.ca/ebm/ebm/htm); and in the useful index called Netting the Evidence (http://www.shef.ac.uk/~scharr/ir/netting.html); hosted by the School of Health and Related Research at the University of Sheffield, U.K.

A simple tool designed also for consumers, called DISCERN (Charnock 1998), has been developed in the U.K. by the University of Oxford, Buckinghamshire Health Authority, and the Help for Health Trust, with funding from the British Library (http:www.discern.org.uk).

It remains to be seen whether these or other instruments will actually be used to assess Web sites. As pointed out by one of the many supporters of EBM, Dr. Muir Gray, Director of National Health Services Research and Development in Anglia and Oxford, U.K., time may work in favor of critical evaluation of information the Web:

"When the printing press was invented, there was concern that the printed word would give undue credibility to an idea or proposition. The same applied to the World Wide Web when it started, although people now have a healthier skepticism for anything on the Web because of the rapid growth of electronic junk" (Gray 1998).

Clearly, the Web is inclusive enough to host charlatans, quacks, quasi-scientists, and frauds, alongside with distinguished scientists and experienced clinicians. If critical appraisal by the audience is key in other media, it is absolutely vital on the Internet.

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# The Demon-Haunted Sentence

## *A Skeptical Analysis of Reverse Speech*

*Advocates of reverse speech propose that it is a direct path to the unconscious mind. However, there is no evidence of its existence, and accepting this pseudoscience could prove tragic.*

TOM BYRNE and MATTHEW NORMAND

In the past several years, a researcher named David Oates has been advocating his discovery of a most interesting phenomenon. Oates claims that backward messages are hidden unintentionally in all human speech. The messages can be understood by recording normal speech and playing it in reverse. This phenomena, reverse speech, has been discussed by Oates in a number of books (Oates 1996), magazines, newspapers, and radio programs, and even on television with Larry King and Geraldo Rivera. His company, Reverse Speech Enterprises, is dedicated to profiting from his discovery. The basics of Oates's theory are outlined in his book *Reverse Speech: Hidden Messages in Human Communication.* He also outlines his theories on Reverse

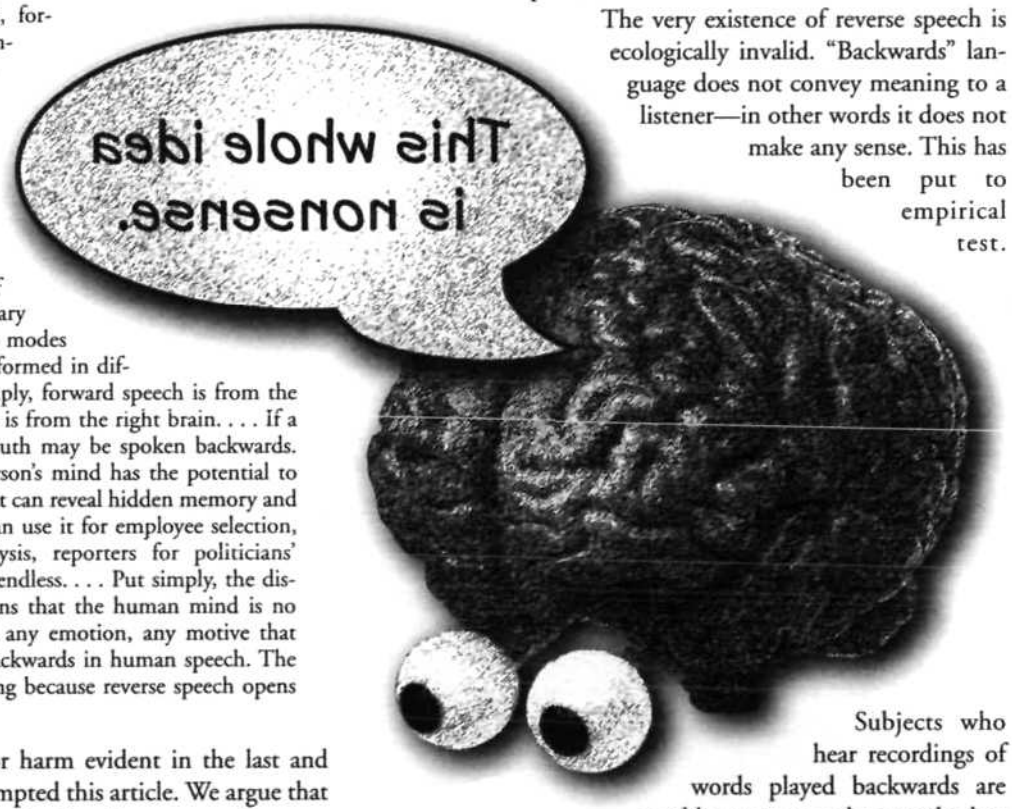
Speech Enterprise's large and detailed Web page (http://www.reversespeech.com). The following quotes taken from that page define the main characteristics and implications of reverse speech; similar statements can be found in his publications.

> Human speech has two distinctive yet complementary functions and modes. The Overt mode is spoken forwards and is primarily under conscious control. The Covert mode is spoken backward and is not under conscious control. The backward mode of speech occurs simultaneously with the forward mode and is a reversal of the forward speech sounds.
>
> These two modes of speech, forward and backward, are dependent upon each other and form an integral part of human communication . . .
>
> Covert speech develops before overt speech. Children speak backwards before they do forwards . . .
>
> Reverse speech is the voice of truth and it is complementary with forward speech. The two modes occur simultaneously yet are formed in different areas of the mind. Simply, forward speech is from the left brain and Reverse Speech is from the right brain. . . . If a lie is spoken forwards, the truth may be spoken backwards. Any thought that is on a person's mind has the potential to appear in Reverse Speech . . . it can reveal hidden memory and experiences. . . . Employers can use it for employee selection, lawyers for deposition analysis, reporters for politicians' speeches. Its applications are endless. . . . Put simply, the discovery of reverse speech means that the human mind is no longer private. Any thought, any emotion, any motive that any person has can appear backwards in human speech. The implications are mind boggling because reverse speech opens up the Truth.

It is the great potential for harm evident in the last and most disturbing item that prompted this article. We argue that there is no scientific evidence for the phenomena of reverse speech; and that the use of reverse speech as lie detection in courts of law or any other forum, as advocated by Oates, is entirely invalid and unjust.

## Where Is the Evidence?

The burden of proof for any phenomenon lies upon the shoulders of those claiming its existence. To our knowledge there is not one empirical investigation of reverse speech in any peer-reviewed journal. If reverse speech did exist it would be, at the very least, a noteworthy scientific discovery. However, there are no data to support the existence of reverse speech or Oates's theories about its implications. Although descriptions of "research papers" are available on the Reverse Speech Web site, there is no good indication that Oates has conducted any scholarly or empirical investigation. We found only two outside analyses of reverse speech. The first, Newbrook and Curtain (1998), is a Web-published document discussed below, and the other is a brief review of Oates's aforementioned book that appeared in *Library Journal*. The reviewer, Susan Brombacher, concluded that Oates's theories are difficult to prove and that he seems more interested in making a profit than educating others. We concur with both points. The Reverse Speech Web page contains a plethora of merchandise and services available to consumers at considerable prices. These include reverse-play tape recorders ($225), T-shirts ($18), signed copies of Oates's book ($29.95), and various training workshops ($850–$1,500). Furthermore, we believe that the reason the phenomenon of reverse speech is difficult to prove is it does not exist.




The very existence of reverse speech is ecologically invalid. "Backwards" language does not convey meaning to a listener—in other words it does not make any sense. This has been put to empirical test. Subjects who hear recordings of words played backwards are unable to report what words they heard (Vokey and Reid 1985). The ability to communicate through language is an incredibly complex marvel of evolution. If reverse speech existed, it would not be comprehensible and would have no practical value. Therefore, there would be no selection mechanism by which it would evolve. It would truly be a "miracle." And, as for all miracles, we do not have a shred of supporting evidence.

## Hearing Things

We are not claiming that reverse speech is a simple hoax. In fact it is quite possible that Oates and his followers are convinced of its existence. As far back as the 1930s, controlled sci-

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entific studies were conducted demonstrating the tendency for people to "hear" things that were not there. One of the methods employed to study such phenomena was the verbal summator, as described by the American psychologist B.F. Skinner (Skinner 1957, 1936). The verbal summator consisted of a phonograph (or tape) of random vowel sounds that were grouped together in such a way as to *not* produce any systematic phonetic groupings. These random phonetic sounds were arranged into patterns that approximated common stress patterns in everyday conversation.

**As far back as the 1930s, controlled scientific studies were conducted demonstrating the tendency for people to "hear" things that were not there.**

After such strings of nonsense syllables were arranged, they were played for subjects at barely audible volume levels. After repeatedly listening to these sounds, subjects reported "hearing" the phonograph or the tape "say" things. These sentences, or sentence fragments, did not actually exist and, as such, were considered to be utterances that were already strong in the subject's repertoire. Put another way, they were "projecting" their own thoughts onto the sounds they were hearing.

Oates frequently plays examples of reversed-speech phrases in which the listener can hear what appears to be meaningful speech. It is not difficult to hear something that sounds like English phrases when they have been pointed out. However, as in messages heard from the verbal summator, the phonemes may sound similar to a meaningful phrase but are really sound salad. A listener expecting to hear a certain phrase will likely do so. In their critique of Oates's theories, Newman and Curtain (1998) conducted a simple experiment in which subjects under various conditions tried to detect examples of reverse speech from Oates's audiotapes. As expected, they found that subjects who were told what to listen for were much more successful in hearing the phrases than those not expecting what they would hear. This is analogous to seeing a certain image in a cloud formation only after another person has pointed it out. Fortunately, most of us recognize that a cloud that looks like Elvis is not really Elvis. Backward phonemes, however, may convincingly sound like a real sentence and are not as readily dismissed as coincidence.

## Potential for Harm

Oates's claims have dangerous implications. He states not only that reverse speech is real but also that it always "tells" the truth. He calls it the "ultimate lie detector test." Although some types of nonverbal communication (e.g., facial expressions) may be of limited use for lie detection, the search for a surefire mechanism that uncovers whatever truths lie in the unconscious is best left to science fiction writers and kept out of courts of law; no such mechanism exists. Adding to the insidious nature of these claims, Oates states that one has to be specially trained to hear reverse speech; those who pay him a hefty sum and go through his training can then serve as expert witnesses and command hefty sums themselves. As expert witnesses they could analyze testimony played backwards and inform a court what a witness is truly saying. The judge and jury, not having the training, will be unable to verify this information. The potential damage could be enormous since the "truth" may be invented from the subjective interpretation of nonsense syllables. Furthermore Oates advocates the use of reverse speech not simply as a lie detector, but as a useful tool for psychotherapists. Although Oates states that he and his colleagues "are not therapists," he describes the goal of one of his training programs as to "Prepare the student to establish their own therapeutic practice" (available at http://www.reversespeech.cpm/courses.shtml). It seems that no matter what Oates and his colleagues call themselves, they are engaging in practices that most people would deem clinical in nature. Advocating therapy based on such questionable theories is unethical.

Hopefully the questionable validity of reverse speech will be recognized before history repeats itself. Not so long ago, belief in facilitated communication, another invented form of communication, led to witch-hunt investigations based on information that had absolutely no basis in reality. In facilitated communication, a nonspeaking individual receives assistance from a "facilitator" who guides his or her hands across a keyboard so that a message can be typed. Curiously, many nonspeaking individuals who seemed to benefit from facilitated communication did not have motor deficits. Therefore, it was unclear why motor assistance would help them communicate. Controlled studies repeatedly demonstrated that the facilitator in fact manifested the messages communicated by the nonverbal individuals either intentionally or unintentionally. (See James A. Mulick, John W. Jacobson, and Frank H. Kobe, "Anguished Silence and Helping Hands: Autism and Facilitated Communication," SKEPTICAL INQUIRER, 17(3): 270–80, Spring 1993.) As stated by Gorman (1998), "When the assisting facilitator could not see or hear the questions presented, autistic individuals could not communicate correct answers, and what was typed was actually what the facilitator saw" (64).

Far from being innocuous, facilitated communication led to false accusations of sexual abuse and resulting court trials that severely disrupted the lives of innocent people. (For a comprehensive history of facilitated communication see Gorman 1998 or Jacobson, Mulick, and Schwartz 1995.) It is easy to see how reverse speech has the same maleficent potential as facilitated communication. The person trained to hear reverse messages could intentionally or unintentionally report that speech contains hidden incriminating evidence. Many people are not prepared to refute such contrived evidence.

The danger of facilitated communication was recognized, and it is no longer considered to be scientifically valid by most professionals working in the disability field (Gorman 1998). In 1994, the American Psychological Association adopted a resolu-

tion stating that facilitated communication is a controversial and unproved communicative procedure with no scientifically demonstrated support for its efficacy. We advocate a similar stance on reverse speech. Without validation of its existence, the potential for harm greatly exceeds any benefits. Until that time, we should not allow the use of reverse speech in any situation in which important decisions must be made.

## Other Issues

Although we seriously doubt the existence of reverse speech, we may be wrong. We encourage Oates or anyone interested in the possibility of reverse speech to conduct empirical investigations. Oates has said that he desperately wants research conducted on reverse speech (Lamorte 1997). Many of his claims involving unconscious thoughts and metaphors are by their nature untestable. However, some simple investigations of his claims could be easily conducted. For example, subjects could listen to samples of reverse speech and report what they heard. Interobserver agreement, the percentage of times that different subjects reported hearing the same thing, could be calculated. Such measures can be used to minimize biases that individual observers may have (Kazdin 1982). High rates of agreement would at least confirm the ability for humans to hear the same messages in the absence of specific expectations.

Another simple investigation could test the claim that reverse speech can be used for lie detection. Researchers could arrange for confederates to lie on tape about some verifiable personal information (e.g., age, height, weight, etc.), and tell the truth about other similar information. If reverse speech always detects the truth, the subjects should be able to separate facts from lies at rates better than chance.

Both of these studies could be conducted with minimal cost and effort. If Oates is truly interested in the truth, he could set aside a few hundred dollars (much less than the cost of enrollment at one of his training programs) and fund an independent researcher.

Numerous other claims of doubtful validity can be found in Oates's writings and on the Reverse Speech Web page. Because the very existence of reverse speech is likely invalid, we will not address each of the minor points here. However, two assertions are particularly amusing and cast further doubt on Oates's credibility. Although Oates does not use specific neurological terminology, he claims that the left hemisphere of the cerebral cortex produces forward speech, and the right hemisphere produces reverse speech. He offers no evidence for this. Years ago, it was discovered that both forward and reverse speech sounds are identified most accurately by the left hemisphere (Kimura 1968). Regardless, hemispheric lateralization is not that specialized even for normal speech. Often people who sustain damage to the left hemisphere early in life develop some speech control by the right hemisphere, and some language deficits can occur after right-hemisphere damage (Springer and Deutsch 1993). Furthermore, speech production is controlled by the right-hemisphere in a segment of the left-handed population. Oates's appeal to neuroscience is uninformed and unsupported. In another example, Oates claims that children learn to speak in reverse before they speak in the typical forward fashion. As stated by Newbrook and Curtain (1998), this is contrary to everything we know about language development.

The reader may notice we gathered much of our information from the Internet. This was not done by choice. Information on reverse speech (aside from that authored or championed by Oates) does not appear frequently on the printed page. This suggests that reverse speech has for the most part escaped scientific scrutiny. It also suggests that the Internet supplies a means to distribute pseudoscience under the pretense of science. Of course, researchers do not have the time to investigate every fantastic claim that pops out of the woodwork. However, in this case the potential for the abuse of an untested theory is considerable. If reverse speech enters courtrooms and therapists' offices, lives may be seriously affected. We hope that readers can help expose this potential disaster before damage is done.

**If Oates is truly interested in the truth, he could set aside a few hundred dollars (much less than the cost of enrollment at one of his training programs) and fund an independent researcher.**

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# Facts and Fantasies of Extraterrestrial Life

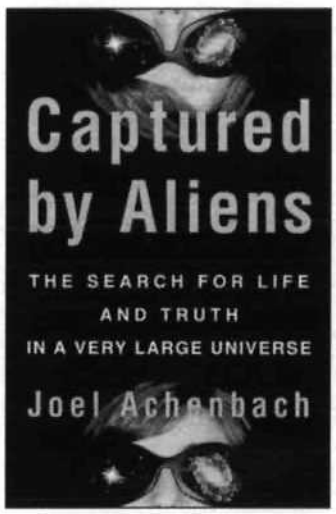
DAVID MORRISON

*Captured by Aliens: The Search for Life and Truth in a Very Large Universe.* By Joel Achenbach. Simon & Schuster, New York, 1999. ISBN 0-684-84856-2. Hardcover, $25.

Science journalist Joel Achenbach has selected the perfect title for this romp through the facts and fantasies of extraterrestrial life. While his personal sympathies are with the scientists (he refers to himself as a skeptic), Achenbach gives a fair hearing to the other side. He credits most of the assorted UFOlogists, victims of alien abduction, self-declared religious prophets, and New Age mystics that he interviews with a sincere (if confused) effort to come to terms with the place of humanity in a vast and mysterious cosmos.

For a scientist, much of the fascination in this book lies in Achenbach's exploration of the boundaries—often less clear than we like to admit—between legitimate scientific speculation and the wider world of mysticism and pseudoscience. We learn that every organization and sect worries about where it lies in the spectrum of legitimacy. For example, the Starseed group that Achenbach visited—people who are convinced their bodies have been taken over by aliens—kept their meetings secret because "they didn't want any nuts calling up." Incidentally, what do you say to someone who believes she was born in the Pleiades?

The book is organized into three parts. The first and third provide a rather straightforward discussion of the science of extraterrestrial life—variously labeled exobiology or astrobiology. In between is a journey through the fringe, from the Heaven's Gate cult to the Roswell celebrations of the fiftieth anniversary of the flying saucer crash. He notes how this fringe world is changing:




> The supernatural and New Age beliefs have largely superceded the traditional study of mysterious aerial phenomena. Seeing a flying saucer just doesn't get you anywhere anymore. You must have contact.
>
> The field has become preoccupied with mystical, personal, subjective encounters with aliens, the abductions, the matings, the carrying of alien fetuses, the channeling of glib, pedantic extraterrestrials.

An admiring yet critical commentary on Carl Sagan and the role he played in the extraterrestrial life debate is woven throughout the book. Indeed, there are aspects of Sagan's complex relationship with these issues that are explored more deeply and thoughtfully in this book than in either of the two recent full-length biographies by William Poundstone and Keay Davidson. Achenbach recognizes Sagan's unique position as the most outspoken defender of the legitimacy of exobiology and SETI as scientific disciplines, as well as a life-long critic of irrational thinking. Once Sagan achieved superstardom with his *Cosmos* television series and book, he was the public lightning rod for both the science and the pseudoscience of extraterrestrial life. As Achenbach characterizes him, Sagan was the "keeper of the gates" who effectively defined the border between science and pseudoscience. He was actively courted by many fringe figures who sought in his blessing a legitimization of their interests or beliefs.

One account of Sagan's gatekeeper role comes from an interview with Richard Hoagland, author of *The Monuments of Mars* and leader of the "Face on Mars" movement. Hoagland explained that in a public meeting in 1985, Sagan made a comment that those planning NASA missions to Mars should be open to discovering the unexpected. The statement seems

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innocuous to me, but according to Hoagland, when Sagan made these remarks, he briefly made direct eye-contact with Hoagland, who was among the journalists in the audience. Sagan's innocent comment thus became a coded message encouraging Hoagland to pursue his advocacy of an artificial origin for the Face.

Hoagland argued to Achenbach that this "endorsement" legitimized his continuing crusade, even after the Mars Global Surveyor obtained high-resolution photos that dispelled any possibility of an artificial origin for the Face. (Hoagland's response was that the NASA pictures were clearly a fake, one of the government cover-ups so often cited by people interviewed in this book.)

Sagan's role is especially interesting because he himself was accused of straying beyond the limits of proper science. As a student, he entertained serious interest in UFOs and held hopes that they might indeed be extraterrestrial spacecraft. Later, he toyed with the idea suggested by his Russian colleague I.S. Shklovskii that Phobos, the larger moon of Mars, might be a huge artifact of some earlier Martian civilization. One chapter in Sagan's 1973 book *The Cosmic Connection* describes his first close-up view of Phobos through the eyes of the Mariner 9 spacecraft, a view that clearly showed that Phobos was a rather battered rocky satellite of natural origin. One can sense the disappointment in this prosaic (although not unexpected) denouement to the story. But as Achenbach argues, it was precisely because of his apparent open-minded attitude toward fringe topics that many on the fringe became so bitter when Sagan turned against them. Both of the famous AAAS symposia on pseudoscience organized by Sagan, on UFOs in 1969 and Velikovsky in 1974, left a legacy of bitter Sagan-haters.

Another important figure in Achenbach's account is NASA Administrator Dan Goldin, himself an outspoken visionary. Evidently Goldin got on well with Achenbach, sharing his dreams of human expansion into the universe, even his vision of "God" as revealed in a magnificent universe of stars (and life). Some of the more daring Goldin concepts include nanoprobes of almost microscopic size (one thinks of a microbe, which is indeed a very sophisticated machine) and interstellar space missions (now receiving serious study at the Jet Propulsion Laboratory [JPL]). Achenbach notes the high regard that Sagan and Goldin had for each other, and he implies that they may have stimulated each other to dream beyond the limits of conventional science and engineering.

Sagan and Goldin may push the limits of the acceptable, but as powerful mainstream figures they cannot go beyond. It is they who define those limits. In the second part of this book, the author casts loose from science and

## Achenbach on the Apparent Absence of Aliens

Civilizations may, over time, become increasingly silent .... Perhaps ... the civilizations that survive and prosper are the ones that don't call attention to themselves. Maybe there is a cosmic natural selection that favors the circumspect species. If you do blast signals into deep space, you run the risk that you will be visited by ravenous space predators with mandibles the size of Volkswagens.

The Space Age is built upon the notion that it is inevitable that human beings will expand across the cosmos. That is our nature—to expand, conquer, replicate, penetrate, smother, absorb. That's what life is all about. Unfortunately, it may not be what life is like elsewhere.... The secret to survival on multi-million year time scales may be sustainability, not expansion. The Old Ones may be members of the Green Party.... The "developed" world may be a good model for the kind of civilization that's ephemeral in cosmic time scales, that simply doesn't stick around long enough to make contact with other civilizations....

* * *

[Looking close to home for answers,] it turns out that we do not really understand what life is, or why it is here. We don't understand ourselves.

We are the mystery! You don't have to look into the night sky to find an enigma. Life on Earth is a phenomenon begging for an explanation. We don't know very much about its origin or how it evolved.... This general ignorance of biology—this ability to live our lives while paying no heed to the biochemistry and neurobiology that make it possible—is at the root, I think, of our tendency to overestimate how many aliens are buzzing around the galaxy.

In Sagan's case, he wasn't ignorant about biology, he simply was optimistic. He felt that life was likely to arise on many worlds, that it would tend to evolve into intelligence. Unfortunately, that supposition remains nothing more that a guess. No one knows what the cosmic rules of biology might be. All we can do for the moment is look at ourselves, our dogs, our cats, the ants in the yard, the flowers, the microbes in the petri dish, the tube worms around the hot vents at the bottom of the sea—and extrapolate like mad.

* * *

The biochemistry of the world is straight out of a Bill Gates fantasy—there's only one operating system for everything.

* * *

All of this makes us appreciate anew our own little world. Earth has had many potential spawning grounds for life, from tidal pools to the hot vents at the bottom of the sea. Earth is that rare place where water stays liquid and splashes around at the surface. It is not some desolate, lousy planet such as Mars or Venus. We live on an amazing world. There may be other planets that are equally amazing—maybe billions of them spread across the universe—but they remain, as with so many other marvels, in the realm of the unknown.

swims into the vast sea of fringe science, mysticism, and hoax. Although he acknowledges the presence of charlatans and con artists, Achenbach generally respects the people he meets for the sincerity of their views, and he lets them speak for themselves. He is rarely judgmental, beyond admitting that he personally cannot see or sense or even follow the alternative reality that seems so real to many of them. But he makes it clear that these people, however foolish they may seem to a mainstream scientist, in fact outnumber the skeptics by a large margin. It is sobering to realize that tens of millions of American voters believe in alien abductions and a massive government cover-up of UFO landings, while still more subscribe to astrology and any number of more recent New Age mystical concepts.

One of the fascinating characters in this book is NASA scientist Henry Harris. Harris works at JPL on futuristic concepts such as space power systems and advanced propulsion for interstellar flight. He is also a keen student of UFOs with many contacts in the fringe community. As portrayed by Achenbach, Harris is a true believer in alien visitation, altered mental states, and the evolution of humans into a more spiritual plane. He "had a comfort level with the fantastic . . . tapped into a universe of ideas that most scientists chose to ignore." Somehow Harris reconciles these quasi-religious beliefs with his NASA job, and Achenbach seems envious of his ability to span both worlds.

Achenbach is a fine science writer, as displayed in his earlier books (such as *Why Things Are: Answers to Every Essential Question in Life*). There is plenty of good science in this book, but the author's touch is always light. He rarely judges and never preaches. This is one of the most accessible and enjoyable books on science and skepticism that you could add to your bookshelf or give to a friend.

# Roswell: Revealing a Pop Culture Conspiracy

JOHN D. GERMAN III

*Little Gray Men: Roswell and the Rise of a Popular Culture.* By Toby Smith. University of New Mexico Press, Albuquerque, 2000. ISBN 0-8263-2121-6. 208 pp. Hardcover, $24.95.

You won't find much academic debunking in *Little Gray Men*, although there is the occasional sarcastic aside aimed at the UFO zealot. Nor will you find a rigorous analysis of the evidence for or against a saucer crash in Roswell in July 1947. What you will find in *Little Gray Men* is the irrefutable evidence of a Roswell conspiracy, but not by the U.S. government.

Award-winning journalist and former Fulbright Scholar Toby Smith details how Roswell the non-incident became one of the twentieth century's most recognizable events, worthy of a seat next to Elvis Presley in this country's popular culture and one major reason more than half of Americans today say they believe in UFOs and aliens.

Even as the book-researching Smith rubbed elbows with Roswell's sundry cast of UFO-believing characters during Encounter '97, the city's cash-flow-successful fiftieth anniversary of the crash, he wonders at the cultural significance of an event that today is the most persistent theme in UFOlogy.

"As I bought a souvenir 'Alien Dog' T-shirt, I knew there was more to Roswell than simply an alleged site, or even alleged sites," Smith writes. "Whether Roswell was substituting fantasy for reality seemed far less significant to me than what Roswell had become. Roswell had served as the launching pad, and continued to be the guiding light, I saw, for almost every societal diversion having to do with UFOs. . . . Roswell became the holy grail, the defining moment, in UFOlogy."

The Roswell story was born and bred by the mass media, Smith says, conceived in a late-night rendezvous between a radio newsman and a Roswell Army Air Field spokesman. Despite the fact that the mistaken "Flying Disk Recovered" press release was quickly retracted, Roswell the Incident was kept alive by the news and entertainment media without a shred of evidence that it was true. It created an American public in the 1950s and 1960s drunk from the promises science fiction offered and hungry for flying saucer news.

Smith wastes no times drawing the correlation between popular culture trends and the mass media, which are "joined tighter, as they say around Roswell, than a tick in a hound dog's ear," he writes.

He carefully frames the sociological underpinnings of an American popular culture made fertile for Roswell by such cultural phenomena as H.G. Wells's fantastic imaginings in *The War of the Worlds*, the promise of space travel heralded by Robert Goddard's rocket experiments in the 1930s and 1940s, the "we are not alone" fears of Sputnik in the late 1950s, and paranoia of government secrecy throughout the Cold War. The explosive growth of the entertainment industry added to the mix, with the newly acquired technological wherewithal to televise to our homes visual fantasies that couldn't be far from reality—and if they weren't real they were at least exciting enough to cause us to send away for our secret alien decoder ring.

Then, like a courtroom prosecutor, Smith substantiates a mass media conspiracy to keep Roswell alive, begin-

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ning with Roswell references in such cultural signposts as the immensely popular *Captain Video* TV series that debuted in 1949, the Dick Tracy comic strips of the 1960s, the movie *Easy Rider* in 1969, a Woody Allen humor piece in the *New Yorker* in 1975, an *Unsolved Mysteries* episode in 1989, the Fox Network's Alien Autopsy in 1995, the movie *Independence Day* in 1996 (which went as far as to suggest that Roswell "stood for America's fight for freedom, liberty, and all things decent," Smith adds), *The Simpsons*, *The X-Files* . . . and the list goes on. In science fiction, Smith writes, Roswell begat such beacons as *The Day the Earth Stood Still*, *The Forbidden Planet*, and *E.T. The Extraterrestrial*, movies enjoyed by generations of Americans. Roswell depictions can even be seen today on the sides of U-Haul trucks, he notes.

In the mass media, "Roswell fills the air, like a necessary element. . . . The remains of Roswell rest everywhere, for popular culture tends to not miss any form of pleasure."

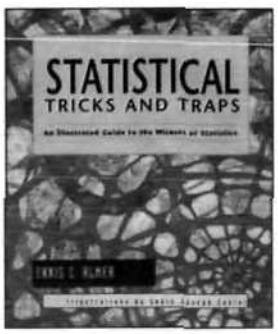
In one chapter, Smith recounts Roswell's history, suggesting that 1940s Roswell had an inferiority complex that made it fertile ground for something culturally significant to happen there. Goddard's rocket experiments conducted just outside of town further cast Roswell the Place as the focal point for a "busy galaxy," he says.

There's a comical hour-by-hour account of Encounter '97 and its significance, both to Roswellians ("Q: Do you need a passport to get into Roswell? A: No, Just a Visa card.") and to American culture.

And the book analyzes common features in alien stories—saucers, metallic wreckage, unusual hieroglyphics, a desert wasteland where alien crafts land (or crash), radar screens and towers, secret hangars, alien bodies stored in freezers, small green (or gray) men with bug eyes, necking teenagers, autopsies, and government denials—and uses this forensic evidence to trace the most popular ones back to Roswell and its unwitting accomplice, Wright-Patterson Air Force Base, Ohio. He goes to great lengths to show that one or more of these story elements appears in nearly every post-1947 work of alien-related entertainment and nearly every first-person close encounter of the last fifty years.

At times Smith reaches, failing to complete the logical steps that trace a particular event in American pop culture back to Roswell. But the quantity of his evidence is overwhelming. His case is so solid that the final two chapters at points seem laborious—listing yet one more science fiction movie or TV series that Roswell begat and then detailing the evidence that links it to Roswell the Incident.

Smith's journalistic style, conveying the most information in the least number of words, sets it apart from a lot of academic studies, and his gift for creating an entertaining turn of phrase or clever metaphor that tells the story and makes you smile—these alone are reasons to read *Little Gray Men*. And for the skeptic who's been around long enough to remember *Captain Video*, it's a worthwhile trip down memory lane. Smith's view from above reveals that on the cultural terrain, as the crow flies we live closer to Roswell than we might think.




# Keeping Out of Number Trouble

MARK DURM

*Statistical Tricks and Traps: An Illustrated Guide to the Misuses of Statistics.* By Ennis C. Almer. Pyrczak Publishing, Los Angeles, 2000. ISBN: 1-884585-23-X. 58 pp. Softcover, $11.35.

Mark Twain once wrote, "If I had more time, I would have written a shorter book!" A book is better written if it can make its point in fewer words. Ennis C. Almer's *Statistical Tricks and Traps* is a verification of Twain's statement. It has brevity *and* clarity, relevancy *and* poignancy. This book should be read by everyone who desires not to be misled or misinformed by advertisers, politicians, journalists, researchers, and even teachers.

Almer describes *statistical tricks* as occurrences where researchers deliberately attempt to mislead their readers. This can be done by either drawing a misleading graph or by selecting inappropriate research methods to generate data for statistical analysis. A statistical trick is intentional! Almer quotes Harry Truman, "If you can't convince them, confuse them!" *Statistical traps*, on the other hand, occur when a researcher "naively or carelessly" does something wrong. Thus, even though a statistical trap is not intentional, it can proffer highly misleading conclusions.

This short text offers twenty-seven illustrations of tricks and traps. One is entitled "100% of the Women in the Workforce?" and gives evidence of how statisticians often use past trends to predict future ones. This same ploy is used by politicians if it gives an air of credibility to their pet programs or pork barrel projects. As Almer relates, this is based on the fundamental assumption that the dynamics causing past behavior will remain the same in the future. But time changes at least *some* dynamics of human behavior.

One example of Almer's creativity is how he explains the problem of com-

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paring two groups of unequal size by the illustration "Who Wants Bottled Water?" The rate of per capita consumption is the correct method and Almer uses this to explain why one may want to open a bottled-water store in Arizona instead of California. Furthermore, Almer takes on the federal government's recent National Household Survey on Drug Abuse when explaining the important difference between percentage and percentage increase. A national weekly news magazine reported there was a shocking 167% percentage increase in the use of cocaine by teenagers in our country. This is true, but the percentage of teenagers using cocaine had gone from 0.3% to 0.8%. In both cases, the increase was less than 1%; but again, a 167% percentage increase! Almer writes in concluding this illustration, "The lesson to be learned here is that when percentage increases are reported, always ask for the beginning and ending percentages. Also, consider the actual number of cases underlying the percentage increase."

In one section Almer, in a clear and precise manner, explains the different uses of the word *average.* Few people realize there are three "averages," and the one that is used can either be the best or worst in describing data. Almer's presentations and illustrations of the mean, median, and mode are excellent. He vividly explains how skewness can make the "mean," the arithmetic average, the worse average. Concerning his explanation for "variability," Almer uses a humorous presentation of data supplied by Bruce Rind of Temple University. The data are happy faces (or no happy faces in the control group) drawn by waiters and waitresses on the checks they present to patrons.

"Happy faces" are involved in another illustration concerning "Assumptions." Almer writes, "One of the major assumptions that underlies statistical studies is that the respondents understand the directions and questions they are given." Almer relates that earlier in his career he was involved in research with kindergartners and first graders and was attempting to measure children's attitudes toward school. The children were instructed to use "three faces which were placed on each page of the students' test booklets." They were a "happy face," a "so-so face," and a "sad face." One of these was to be used as answers to questions of how they felt when they came to school and how they felt when they did their homework. After several sessions of puzzled looks from the children, Almer interviewed about thirty children and found that none knew what "so-so" meant!

Finally, in an example labeled "Unhealthy Water?" Almer gives one of the most understandable explanations of John Stuart Mill's Method of Agreement, Method of Difference, and Joint Method of Agreement and Difference (methods of logical inquiry) that I have ever read.

I have mentioned only a few of the illustrations in this book. All are excellent. The length of a book is not important—the width of it is! Almer's *Statistical Tricks and Traps* is very wide, and Mark Twain would have been very proud of him. □

## NEW BOOKS

*Listing does not preclude future review.*

***Alternative, Complementary, Holistic & Spiritual Healing: An Examination of Non-traditional Healthcare Systems.*** **Harry Edwards.** Australian Skeptics Inc., P.O. Box 268, Roseville, NSW 2069, Australia. 1999. ISBN 0-646-35356-X. 452 pp. Softcover. $18. ($16.50 + $1.50 shipping and handling through the Teacher's Press, 3731 Madison Ave., Brookfield, IL 60513). There are few books available that provide critiques of "alternative" health care, and here a longtime researcher and investigator for the Australian Skeptics organization provides a guide intended to help fill that gap. The idea is to give a brief introduction so that the reader can make informed decisions. The book tackles scores of topics, arranged alphabetically, from *absent healing* and *actualism* to *macrobiotics* and *magnetic therapy* to *wheatgrass diet* and *Willard's Water.* For each topic he gives a short history, the theory or philosophy behind the practice, its *modus operandi,* and finally an assessment based on scientific or rational inquiry or just common sense. There are also chapters on miscellaneous techniques and therapies; the placebo effect; gizmos, gadgets, pills, and potions; quackery; and "alternative" consultations. Indexed.

***Evolutionary Catastrophes: The Science of Mass Extinction.*** **Vincent Courtillot.** Cambridge University Press, 40 W. 20th Street, New York, NY 10011. 2000. ISBN 0-521-58392-6. 173 pp. Hardcover. $24.95. It is now widely accepted that a small number of catastrophic events have caused mass extinctions and fundamentally changed the path of evolution. Asteroid impacts have generally taken precedence over massive volcanic eruptions as the primary cause. Here Courtillot, a professor of geophysics at the University of Paris, suggests that cataclysmic volcanic activity can be linked not only to the famous Cretaceous-Tertiary mass extinction but also to all the main mass extinction events in the history of Earth.

***Paranormal Beliefs: A Sociological Introduction.*** **Erich Goode.** Waveland Press Inc., P.O. Box 400, Prospect Heights, IL 60070. 2000. ISBN 1-57766-076-5. 310 pp. Softcover. $17.95. A major new sociological examination of paranormal beliefs, by a SUNY-Stony Brook sociologist (and author of "Two Paranormalisms or Two and a Half?" in our November/December 1999 issue). Paranormalism (which Goode defines as "the nonscientific approach to a scientifically implausible event believed to be literally true") and paranormal beliefs are not without consequence or significance, Goode argues; they relate to and affect a wide variety of social institutions from politics to religion to education. Part One provides a general introduction. Part Two discusses science and paranormalism, including paranormal (and everyday) versus scientific thinking and gives the paranormalism critique of science and science's replies. Part

Three discusses four types of paranormal belief systems: astrology and psychic powers; creationism; parapsychology; and UFOs. Part Four discusses institutional connections to religion, the media, politics, conspiracy theories, and American Indian prehistory. Part Five offers conclusions.

***Return to Ether: When Theory and Reality Collide.*** **Sid Deutsch.** Scitech Publishing Inc., 89 Dean Road, Mendham, NJ 07945. 1999. ISBN 1-891121-10-3. 169 pp. Hardcover. $24.95. Nineteenth-century physics "created" the ether to explain how electromagnetic waves are transmitted. But with the arrival of the twentieth century and quantum mechanics, the ether was abandoned, even though quantum mechanics has never been able to explain certain weird effects that occur at the atomic and subatomic levels. Here a distinguished scientist, engineer, and educator restores the all-pervading ether to explain the quantum weirdness of the behavior of single, isolated photons and electrons. Through a series of reasonable "conjectures," he argues how and why it is necessary to resuscitate the ether to get a scientific explanation of how weird "quantum" effects come about.

***Taboo: Why Black Athletes Dominate Sports and Why We're Afraid to Talk About It.*** **Jon Entine.** Public Affairs, 250 W. 57th Street, Suite 1321, New York, NY 10107. 2000. ISBN 1-891620-39-8. 387 pp. Hardcover. $25. A journalist and Emmy-winning producer, formerly with NBC and ABC News, tackles one of the nearly taboo subjects of modern life: Why are blacks better athletes than whites and why are we so scared of discussing it? Entine, whose NBC documentary "Black Athletes: Fact & Fiction," written with Tom Brokaw, was named the International Sports Film of the Year, explores the genetic, cultural, and physiological roots of black athletic superiority. Drawing on the latest scientific research, he shows why biology and ancestry are significant components of the success of black athletes. He shows how the frequent favored explanation for black dominance—a dearth of opportunities elsewhere, channeling into specific sports, and hard work—fails to explain the dimensions of the monopoly. Entine is fully aware of all the sensitivities involved with this topic and he addresses all of them carefully and fully.

*—Kendrick Frazier*

## ARTICLES OF NOTE

**Bargh, John A., and Tanya L. Chartrand. "The Unbearable Automaticity of Being."** *American Psychologist*, 54(7):462–479, July 1999. The authors question the assumption, which much of contemporary psychological research is based on, that people have the ability to exercise conscious control over their world. The authors find this ability to be quite limited and go on to describe and review the "mechanisms that produce automatic, environmental control over these various phenomena." They find that the nonconscious mental systems, which they call "mental butlers," perform the majority of the "self-regulatory burden."

**Bower, Bruce. "The Mental Butler Did It."** *Science News*, 156:280-282, October 30, 1999. Bower reports on Bargh's article, "The Unbearable Automaticity of Being" (listed above), and related research.

**Chamberlain, Sara. "A Veiled Resistance."** *Geographical*, 71(8):44–51, August 1999. In Morocco, where women have few legal rights, claims of magical powers can give women some control. Besides the usual bizarre spells, some sorceresses use potions professed to cause anything from impotence to death.

**Hoh, Erling. "The Chinese Puzzle."** *Geographical*, 71(8):52–57, August 1999. Some historical records hint that Roman legionnaires settled in China around 30 B.C., 100 years before the first official contact between the two empires. Disagreement among scholars has not prevented the local government from using the claim as a tourist attraction.

**Jaroff, Leon. "What Will Happen to Alternative Medicine?"** *Time*, November 8, 1999, p. 77. Founding editor of *Discover*, Leon Jaroff writes that "alternative medicine is merely a politically correct term for what used to be called quackery," and argues that as the public becomes better informed, and as modern medicine continues to make rapid advances, alternative medicine will be thrown into the "dustpan of medical history." This article is part of *Time*'s special issue on *Beyond 2000*.

**Krauthammer, Charles. "The Real Message of Creationism."** *Time*, November 22, 1999, p. 120. The Kansas School Board ruling to include creationism in the curriculum is not "the beginning of a creationist wave . . . but an important cultural indicator," says Krauthammer. He reasons that since religion has been banned from academia, the only way "people of faith" can include it in the schools is by bringing creationism in through the back door "under the guise of science." Says Krauthammer: "Creationism has no part in the serious curriculum of any serious country. Still, I see no reason why biblical creation could not be taught in the schools—not as science, of course, but for its mythic grandeur and moral dimensions."

**Panek, Richard. "A Star is Born."** *Lingua Franca*, 9(8): B8–B11, November 1999. A review of two new books, both entitled *The Star of Bethlehem*. The authors, both astronomers, look to Roman astrology for clues regarding the elusive star. Mark Kidger argues for several planet-and-star events that took place over two years. Michael R. Molar's book fingers Jupiter, which went retrograde in the constellation Aries in 6 B.C. Panek says that Molnar's book convincingly reveals the culture of the period, making the scientific (much less religious) accuracy of his hypothesis secondary.

**Preston, Morag. "Witches on Parade."** *(London) Times Magazine*, 4(15):42–46, October 16, 1999. Fort Hood, the largest army base in the Western world, has more than 300 Wiccans. The Pentagon ruled that they can practice their rituals on the base like more mainstream religions. Various political and Christian groups disapprove.

**Price, Matthew. "Who Owns Arthur Koestler?"** *Lingua Franca*, 9(6):63–67, September 1999. The anti-Communist Arthur Koestler, who left his papers to a university that would endow a parapsychology chair, is the subject of controversy. The authors of two biographies of Koestler—one published, one not—are arguing over who had the right to use the material, as well as over claims that Koestler was a rapist.

**Raison, Charles L., Haven M. Klein, and Morgan Steckler. "The Moon and Madness Reconsidered."** *Journal of Affective Disorders*, 53:99–106, 1999. The authors examine people's belief throughout history in the power of the Moon and its effect on the mind. They propose that before modern lighting was invented, "the Moon was a significant source of nocturnal illumination that affected sleep-wake cycle, tending to cause sleep deprivation around the time of full moon." They go on to say that this loss of sleep would have been enough to

induce "mania/hypomania in susceptible bipolar patients and seizures in patients with seizure disorders."

**Scocca, Tom. "Heaven's Gatekeepers."** *Lingua Franca*, 9(6):56–61, September 1999. Usage time on large telescopes is under heavy demand. Astronomers Burbridge and Arp, who challenge the Big Bang theory, claim that the committees who control the use of the telescopes are deliberately stifling unpopular theories.

**Spanos, Nicholas P., Cheryl A. Burgess, Melissa F. Burgess, Catherine Samuels, and William O. Blois. "Creating False Memories of Infancy with Hypnotic and Non-hypnotic Procedures."** *Applied Cognitive Psychology*, 13:201–208, 1999. The authors tested whether false memory reports were likely to be elicited from hypnotic or non-hypnotic participants. They found three circumstances that lead to individuals' remembrance of false memories: when an "authoritative source" makes such a memory seem plausible; when the individual is given information that leads them to expect that they possess such memories; and lastly when they are "administered procedures that they believe will facilitate the recovery of their hidden memories."

**Wiseman, Richard, and Julie Milton. "Experiment One of the SAIC Remote Viewing Program: A Critical Re-evaluation."** *The Journal of Parapsychology*, 63(1):3–14, March 1999. In 1998, the authors wrote a paper describing many potential leakage pathways in Experiment One of the SAIC remote viewing program, to which the original author, E.C. May, responded. In this report, the authors "counter May's assertion that the proposed leakage paths could not have accounted for the observed difference between performance in the static target and dynamic target conditions and refute May's claim that there is empirical evidence from the literature that indicates that our proposed information pathways cannot be effective." The authors also state that May offers no adequate evidence to support his claim.

*—Jodi Chapman and Robert Lopresti*

# SCIENCE BEST SELLERS

## Top Ten Best Sellers from **London**

**1** ***Unweaving the Rainbow***
Richard Dawkins;
Penguin

**2** ***Almost Like a Whale***
Steve Jones;
Doubleday

**3** ***Mapping the Mind***
Rita Carter;
Orion

**4** ***Galileo's Daughter***
Dava Sobel;
Fourth Estate

**5** ***Leonardo's Mountain of Clams***
Stephen J. Gould;
Penguin

**6** ***Time: A Traveller's Guide***
Clifford Pickover;
Oxford University Press

**7** ***Figments of Reality***
Ian Stewart and Jack Cohen;
Cambridge University Press

**8** ***The Crucible of Creation***
Simon Conway-Morris;
Oxford University Press

**9** ***A Fish Caught in Time***
Samantha Weinberg;
Fourth Estate

**10** ***Cats' Paws and Catapults***
Steven Vogel;
Penguin

By arrangement with *New Scientist* magazine, November 1999.
See Planet Science at **http://newscientist.com** for more reviews.
Some books also available at the Planet Science Shop.

# Knowing the Place

RALPH ESTLING

Members of the Natural Philosophy Alliance are, I gather, not happy bunnies. Lately, as their August 1999 newsletter reveals, their unhappiness embraces SKEPTICAL INQUIRER in general and Martin Gardner in particular. But far and away they are most unhappy with the world of physics. Most of their members are convinced that Einstein got it wrong, all wrong, with his Special Relativity, but most are convinced he got it wrong in ways that other members of the NPA disagree with, so that besides arguing vehemently against Einstein, they argue even more vehemently with each other over the precise nature of Einstein's errors and why the other NPAer has completely misunderstood the mistakes so clearly apparent to the NPAer who is pointing all this out. Some of their number are convinced that life violates the second law of thermodynamics. Some have opinions about physicists that are interesting, even beguiling, and some of which I agree with. Very few of them appear to be fools. All of them arouse in me feelings that are a mixture of pity and irritation.

They are so *sure*, so absolutely certain that they are right and that the vast majority of the world's physicists are wrong. About relativity, astrophysics, particle physics, quantum mechanics, the whole shebang. What seems to anger them most, what seems to enrage and infuriate them, is that physicists don't pay any attention to them, don't seem to notice them, won't argue back, just ignore them or, more likely and even more agonizing, aren't aware of their existence. You can see where the pity comes in.

Irritation is evoked because all their energy is engrossed in preaching their various notions, declaiming their *idées fixes* to each other and to any other listeners, willing or otherwise. This is the mark of the obsessive, the dead giveaway of the crank and the crackpot, the reason why some of their ideas about physics and physicists that are not cranky or crackpotty make no impact.

The thing is, these Natural Philosophers aren't interested in learning anything. It doesn't seem to occur to them that they may have anything *to* learn. They have never asked themselves, and seemingly never will ask themselves, the questions: Why live, if not to learn? Why learn, if not to understand? And how are we to understand if we do not reason? They have too many points that need too much scoring, too many axes that require too much grinding. They have no sense of humor and therefore no sense of perspective.

I'm reminded of Garrett Hardin's definition, in his book *Naked Emperors*, of an intellectual: a person "skilled in words but deficient in the imagination required to see the reality behind verbal counters."

The pity and the irritation.

Which reminds me of T. S. Eliot and the Marx Brothers. First, the Marx Brothers. Groucho is storming about an uncaring world, a world too ready to dismiss the ideas of geniuses such as he. "They said Fulton was crazy! They said Edison was crazy! They said my Uncle Morty was crazy." Chico interrupts. "Your Uncle Morty *was* crazy." "What's *that* got to do with it!" Groucho shrieks.

NPAers appear to share Groucho's outlook. Because it can be shown that scientists have sometimes refused to take seriously the brilliant flashes of genius and insight that have occurred outside their circle, we should assume that all persons possessed of all ideas scientists refuse to take seriously must, *ipso facto*, be brilliant.

And yet, and yet. . . .

Might it not still be that our pitiable, irritating NPAers and others like them do have something to teach us about science, and about ourselves, though what it is may be intangible, not so easy to pin down in words and thought. T. S. Eliot once tried to capture this vague feeling that goes with the certainty that we are uncertain, not quite sure, vaguely but profoundly aware that there is much for us to learn, and much to unlearn.

> "We shall not cease from exploration
> And the end of all our exploring
> Will be to arrive where we started
> And know the place for the first time."

*Ralph Estling writes from Ilminster, Somerset, U.K.*

# CONstructivist ARTISTS

GEORGE ENGLEBRETSEN

In spite of the fact that constructivism, as a metaphysical view, has a long and venerable history, it is held today by a number of postmodern philosophers, social scientists, and education theorists to be a new, cutting-edge theory. As a philosopher I happen to reject traditional constructivism because I believe there are good counterarguments to it. I reject the new, contrived version of constructivism, however, simply because it is prime facie nonsense. In the late Middle Ages constructivism was an alternative to what one might call the "default" theory—realism.

Realism, generally, is the view that there is a single, real world that is the way it is independently of us. In no nontrivial way is the world dependent upon its being known by any of us or upon anything we might say about it. Realism is the view underlying both common sense and modern science. Conceptualists held that if the world really were that independent of us then it would be unknowable. Consequently, since we can have at least some knowledge of the world, it cannot be fully independent of us; it depends in some way on how we conceive it to be. This theory is one to reckon with. It should be, and has been, taken seriously by both friends and foes for a very long time.

Early in the twentieth century mathematical constructivism was formulated. In mathematics realism took the form of the claim that mathematical objects (numbers, geometric shapes, etc.) were part of the real world and that mathematical truths were there to be discovered. Mathematical constructivists rejected this version of realism and added that mathematical truths, and indeed mathematical objects, exist only insofar as they are the results of a well-constructed proof. Again, this version of constructivism is a view that is taken seriously, whether accepted or not, by those interested in the philosophy of mathematics.

So what is this New Age constructivism? Suffice it to say that it is not traditional constructivism (though it steals a bit of respectability from the original by wearing its name and hat). In that vast territory carved out of the academy by the postmodern nitwits, "constructivism" is one of the buzzwords. One hears young philosophers saying, "Each of us constructs our own reality. The myth of science is that there already exists a real world." One hears feminist and other political ideologues saying, "*Women construct a feminine reality*" or "Native peoples were better at constructing their reality than were their white conquerors." One hears education theorists saying, "The teacher must give the students the tools required for them to construct the concept of number (or nation, or species) for themselves." The new constructivist tends to say such things without being prepared to say just what constructivism is, let alone offering arguments to support it. But one can make a beginning at least. The new constructivist holds that *what there is* and *how it is* is just a matter of what a given person says, hopes, wishes, pretends, or believes. So-called social constructivists simply replace "a given person" with "an appropriately demarcated group of persons" (e.g., women, natives, the poor, whites, autoworkers). Constructivism has become a kind of radical relativism. There is no truth, just lots of "truths." Still, the point is that for most of these pseudointellectuals what is important is that the right buzzwords are being deployed. And "constructivism" is one of the big buzzwords.

There are other such words, ones often used in close proximity to "constructivism." "Holism" and "holistic" are high on the hit parade. Modern science is seen as radically anti-holistic. It analyzes, breaks apart, dissolves, destroys. By contrast the New Age is holistic. It refuses to analyze. It takes things in their entirety. It is nonexclusive. It is righteously inclusive. Modern medicine treats the disease; holistic medicine treats the whole person.

Another popular pair of terms are "alternative" and "freedom of choice." The former is used almost always to mean "*other than what is standard.*" And, of course, in most areas what is standard consists of those principles and practices that have been established by modern science. Consequently we are urged to allow, embrace, fund such things as alternative medicine, alternative psychotherapies, alternative ecologies, alternative teaching strategies, all of which are deemed effective simply by virtue of not being standard. A hidden, mistaken assumption in all this is that standard scientific practice somehow manages to be single-mindedly monolithic and able to repress all possible alternatives within its range of power. (Attendance at almost any scientific conference would quickly disabuse one of such an assumption.) At any rate, since there are many alternatives one wants to make sure that we are all free to

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choose among them, that we have "freedom of choice." Both the terms "freedom" and "choice" are important here. We should be given a choice—the alternatives; and we should be free to make our choice. But "freedom" is used by the new sophists in another, more subtle sense. Traditional science is bound, limited, restricted by an unnatural allegiance to the use of reason and evidence. The new constructivist is happily free from such restrictions. When it comes to saying how things are, the constructivist, unlike the rest of us still wearing our blinders of rationality, has freedom of choice.

Finally, the postmodern advocates are fond of tossing into their verbal soup the old word "democracy." In olden days democracy was a form of rule in which political power was in the hands of the "demos," the citizens. A corollary was that each such citizen shared the power equally with all the others. Today, when *representative* democracy is the norm, we tend to think of democracy as involving the notion that each person has the same civil rights enjoyed by every other person. That's what most of us mean when we say that everyone is equal. We are clearly not all equal in all ways (otherwise I would be earning millions as a seven-footer in the NBA). We just enjoy, ideally, equal rights. But the sophists, old and new, are clever. "Democracy" is a strong word, with almost exclusively positive connotations. The concept of equality is at the heart of democracy. They know this. So they use the term with great abandon. And what do they mean by it? Just this: all beliefs are of equal value, equally viable, equally true!

Today's postmodern constructivists have mastered the art of verbal abuse. They are true artists. They are con-artists. They are to be taken seriously not because of the force of their arguments (they eschew argument); they are to be taken seriously because of the force of their numbers. They have persuaded very large numbers of the gullible, and they have done so in a place that was meant to be the reserve of rationality—the academy.

# A Skeptical New Age Music DJ

TANI CHEN

As a disc jockey of New Age music, I would like to increase its visibility and influence as a valid form of music in its own right. I would also like to give many musicians and artists as much public exposure as possible, which is not easy in a weekly two-hour radio and Internet program. However, because of its association with other New Age concepts and beliefs, I do not want to disseminate false or misleading claims, or to promote concepts of little scientific or medical worth.

What exactly is New Age music? Although there continue to be disagreements as to its exact definition (Leacy 1999), I would describe New Age music as a genre of music that is generally slow-paced, usually instrumental music, which can include unfixed or varying rhythms or lack a defined melodic structure. New Age music may also include unusual instrumentation, such as the *didjeridu* (Australia), the *huqin* (China), or the glass armonica (U.S.), among many others. Although no one particular piece or artist fits all of these definitions (see Werkhoven 1998), New Age music can be considered to be a specific style of music, much as jazz and rock are specific styles of music.

Besides the term "New Age music," various other terms have been proposed over the years for this genre, including "contemporary instrumental" (too long at nine syllables, not to mention that the human voice is also used), "adult instrumental" (pornographic music?), "instrumental" (which could include other genres, such as jazz or classical), "conint" or "conin" (shortened forms of contemporary instrumental, although not intuitively obvious), "Muzak" (which is trademarked by the Muzak Company), "elevator music" (usually derogatorily), and even "lifescape music" (which could mean anything). Other terms, such as "spacemusic," "ambient," "electroncia," "solo instrumental," etc., are more specific and do not encompass the entire genre. None of these terms have the simplicity or the recognition power that "New Age music" does, so "New Age music" continues to be widely used, despite its obvious flaws and associations.

This association can be harmful to the promotion of New Age music (Leacy 1999). Many people avoid the New Age music sections of record stores based simply on the "New Age" title, without knowing what New Age music actually is. I regularly get calls from listeners who are surprised to find that what they have been listening to is considered to be New Age music. One person even argued with me and refused to

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believe that it was New Age music.

Many composers wish that the genre were called something else, without being associated with the rest of the "New Age" field (Leacy 1999, and various references therein). Many of these artists are from small record companies and are interested only in increasing their exposure and sales. One label even resorted to giving away albums just to increase exposure (Sarno 1999). However, there are other New Age musicians who take advantage of this association to promote various New Age concepts (usually musical "healing"), as well as their music (Halpern and Fuentes 1999; Aeoliah 1998; Summer 1996).

So how does a skeptical DJ of New Age music determine what to air? For most of the music I receive, the artist or label is interested in getting the music aired (and hopefully increasing sales), and does not claim any specific benefits (other than maybe increasing the size of the listening audience). Alternatively, labels will add disclaimers to the music, such as "This music . . . is not intended to replace traditional medical treatment" (Evenson 1999).

However, other artists do include some dubious claims as part of their promotional materials or album jackets. In these cases, I still like to promote the music as music *per se*, but I do not want to promote their claims. I have a few options available—not playing the album, playing the album for its musical content, or playing and questioning the album on the air. Examples follow.

(1) **Do not play the album.** Music in this category usually promotes very specific ideas and claims. This includes either religious- or cult-oriented music (e.g., Gabriel of Sedona 1997), and music that supposedly has direct health or psychological benefits, usually from "subliminal" messages (Summer 1996). In these cases, it is usually impossible to air the music without simultaneously promoting the pseudoscientific claims of the artists. Fortunately, music in this category is rarely sent to me, being targeted more toward "self-help" audiences rather than a radio show.

(2) **Play the album for its musical content.** This is especially true for religious, ethnic, or holiday music. Music has often been written and played as a form of religious worship, and this music can often be enjoyed as pure music. Noteworthy recent examples include the *Sacred Treasures* collection (Ivanoff et al. 1999; Hearts of Space Music 1998), and *Prayer: A Multi-Cultural Journey of Spirit* (Soundings of the Planet Music 1998). For these pieces, a simple qualifier or description of the piece is usually enough to place it in proper context.

(3) **Play and question or even criticize the album on the air.** This can be a difficult thing to do properly. In general, I would only air music that can be gently critiqued. If more extensive criticism is warranted, then the criticism would be too disruptive to the flow of music on the show and I would not air the album. Usually, this criticism is for music that specifically claims to heal certain ailments, rather than subjectively claiming to be "soothing," "stress-relieving," "relaxing," or "meditative" (or many other equivalent synonyms).

The most popular claims seem to be music infused with "Reiki" energy (e.g., Deuter 1998; Hwong 1998), or will tune the "chakras" (Aeoliah 1998; Halpern 1975). Reiki energy is supposedly a "healing energy" that is transmitted by touch (Deuter 1998) (which immediately begs the question of how it can be transmitted via music), while a chakra apparently is an "energy center" of the body that controls a particular activity, which can somehow be tuned by listening to music (Aeoliah 1998).

For these pieces, I will usually criticize it by questioning the "chakra" or "Reiki" concept on the air, but mention that the music is worth listening to as music and not as a substitute for a doctor, despite what the album cover says. This critique is typically not disruptive to the flow of the show, but, I hope, fosters a more evaluative mindset towards that album. In addition, there's a certain amount of leeway a DJ gets from being considered an "expert" in the music being played, and the audience would expect some level of criticism towards the music.

In conclusion, New Age music is a specific style of music. As with other music genres, there are good musicians and bad ones. Many musicians avoid making outlandish claims, focusing instead on the creation of music as an artistic form of expression. However, some musicians do make unscientific claims, which should be treated with skepticism and not promoted as fact, especially towards the general public. The name "New Age music" for this genre is unfortunate, but in time, it may become regarded as a meaningless title, much as "jazz" and "rock 'n' roll" are (Bryson 1994).

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# Further Thoughts on the Star of Bethlehem

PHILLIPS STEVENS, JR.

Martin Gardner's thoughts on the Star of Bethlehem (November/December SI) are strengthened when we realize that the phenomenon appears only in a few lines of the second chapter of Matthew's gospel; and no one but the Magi "see" it. I want to offer some further thoughts on the presence of the Star in the Christmas story.

Scholars agree on the historicity of certain aspects of Jesus' teachings and his death. Most agree that the accounts of his birth were late constructions, afterthoughts, by Matthew and Luke, as well as by even later, noncanonical gospelers such as James and other writers of the so-called "Infancy Gospels." For Paul (c. 50–60) and Mark (c. 70) the childhood of Jesus was irrelevant, as childhood was in the classical world; it was the deeds of adults that shaped human events. But by the time of Matthew (c. 80) and Luke (c. 90) the new religion was threatened by the spreading cult of Gnosticism, influenced by Persian dualism, which asserted that matter and spirit were absolutely separate; if divine, Jesus could not have been mortal, and the doctrine of the Resurrection of the Body was fraudulent. Matthew and Luke therefore went to great effort to establish Jesus' humanity. Fully aware of the standard events in the life of the classical hero, they modeled much of their story of Jesus' life after the greatest hero of all time, Moses. John, whose Gospel represents a tangential body of tradition, may or may not have known of the birth stories; but by his time (c. 100) the Gnostic threat was strong and dangerous, and he emphasizes how the divine "Word became flesh and dwelt among us," and stresses the humanity of Jesus throughout his Gospel.

We cannot overstate the influence of the religion and culture of Persia on the development of Christianity. The sack of Babylon by Cyrus the Great in 539 B.C. ended the Exile. Cyrus aided the Jews in their return to Israel, contributed to rebuilding the Temple, and was hailed as a messiah (Isa. 45:1, II Chron. 36:11–23.); and Persian culture became ennobled and exemplary in Israel. New concepts of angels, the establishment of Satan in his horrible underworld realm where he commanded legions of evil spirits and possessing demons, and the structure of the whole Apocalypse concept in Revelation—including the idea of 1000-year cycles, were among the direct influences of Persia's religion, Zoroastrianism. And Cyrus the King sought advice from a group of specially gifted people, the Magi, Median magicians, dream interpreters, and astrologers. Such practices were forbidden to the Hebrews (see especially Deuteronomy 18:9–13), and their knowledge of them was scant. But such occult abilities had always been appealing to the Jews, and now they were especially so; Cyrus was a good king, his kingdom was the largest the world had ever known, and he was their special friend.

Matthew and Luke carefully construct accounts of Jesus' birth, and link them directly to historical events and personages—though they do not agree; for Matthew, Jesus was born at the end of Herod's reign, 4 B.C.; for Luke the event occurred when Augustus was Caesar and Quirinius was governor of Syria, A.D. 6.

No matter; this is a slight detail. In their efforts to establish Jesus as a full-fledged Hero, and the true Messiah, the Gospelers carefully construct a Davidic lineage for him. Jesus was a Galilean, probably from Nazareth in the Northern Kingdom of Israel; but the birth stories have him born in Bethlehem, in the southern kingdom of Judea (Judah), site of David's birth and anointing.

And only Matthew brings in the Magi and the Star. Modern scholarship recognizes that Balaam's prophecy, "there shall come a star out of Jacob" in Numbers 24:17, foretells King David; but as the Gospelers emphasize Jesus' direct descent through the Davidic line it may be, as Gardner and others have suggested, that the Star in the birth story was thus inspired. In the classical world, a star was often emblematic of or metaphorical for a divine ruler; and this convention was set in Jewish tradition. The ascribed name of the second century A.D. messianic revolutionary leader,

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Bar Kokhba, meant "Son of the Star."

But the major reason for Matthew's star was surely in his wish to have representatives of Cyrus, the greatest king in history, come and kneel before the new King. The Magi say "We have seen his star in the east" (or, "at its rising"). The "east" had great significance in classical cosmologies, as it does in many today; it signified the rising of the sun, and hence origin, birth, and earthly and heavenly greatness. Zoroastrianism's high god was Ahura Mazda, or Ormazd, principle of Light—i.e., truth, honesty, openness; his military leader was Mithra, the Sun. The Magi's eastern, rising star represents Jesus who will outshine all others (light is a frequent Gospel metaphor for Jesus, and later, after Constantine in about 340 A.D., Christmas was moved from late November to coincide with the winter solstice and to cancel out Mithra's birthday on December 25).

Throughout their history the Hebrews had been exposed to various forms of divination by augury and reading of omens in nature, and they admired and were constantly tempted by such occult practices. They were frequently admonished by God and the prophets not to succumb to them; but nowhere in scriptures were such practices declared as false. In the New Testament only the Magi see the star. King Herod doesn't see it; he learns with alarm of the Magi's astrological predictions, and summons them "secretly" to ascertain "the exact time when the star had appeared," as if he wanted to figure the astrological calculations for himself. But he can't; he orders them to report back to him; but the Magi, true to their calling, interpret a dream and figure out what Herod is up to.

The Jews' poor knowledge of—but respect for—astrology naturally led them to assume that stars actually behaved in bizarre ways for those who could "read" them. These considerations offer the best explanation for Matthew's account of the star "leading" the Magi over their nearly 1,000-mile journey, and its stopping over the stable in Bethlehem.

Various efforts, both scientific and pseudoscientific, to identify an actual celestial phenomenon that might have inspired the Star story have been made throughout the modern era. Two efforts by serious scientists have recently appeared, both in 1999. Astrophysicist Mark Kidger, in *The Star of Bethlehem: An Astronomer's View* (Princeton), presents new evidence for an actual astronomical event: the now dim star DO Aquilae which, he says, around the time of Jesus' birth was a bright nova, and was probably the unusually bright star described by Chinese astronomers as having appeared in the sky for seventy days in 5 B.C. Astronomer Michael Molnar argues that it was an astrological rather than an astronomical event. In *The Star of Bethlehem: The Legacy of the Magi* (Rutgers), he looks into ancient astrological records and suggests that it was an extraordinary double event: a morning appearance, and lunar eclipse, of Jupiter, "the planet of kings," both of which occurred on April 17, 6 B.C. On that day Jupiter appeared in the constellation Aries, in the eastern sky. Molnar finds support for his theory in an early first-century Syrian coin which depicts Aries the Ram, identified as an astrological symbol for Judea, looking at a star.

Such efforts are intriguing, but irrelevant. Like many other famous efforts to "explain" fantastic biblical events, such as Moses' parting the Red Sea, or searches for evidence of the Flood, or Noah's Ark itself, or calculations to account for Joshua's stopping the Sun and Moon, they may employ sound science, but they are based on fundamentally flawed premises. They operate from modern premises of time, history, causality, and literacy, and ignore standard, universal elements and processes of myth and oral tradition which shaped accounts of the exploits of heroes in the classical world. And they remove specific elements of folklore from their total cultural contexts—most importantly, as Gardner emphasizes, from the context of faith, and analyze them under the assumption that they are based in historical fact. □


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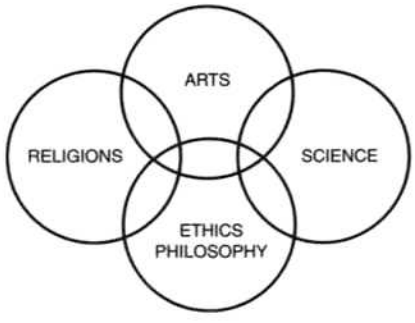
## Readers' Forum on Science and Religion II

*We here present several more selected letters from among the hundreds received in response to our special issue on Science and Religion: Conflict or Conciliation? (July/August 1999). The first Readers Forum on Science and Religion appeared in the November/December 1999 issue.*

The relation between science and religions can be characterized by the different meaning of universality in the two approaches. Universality in science means that factual statements and theories are independent of the race, nationality, or religion of the scientist: there is no Catholic biology, Protestant thermodynamics, Jewish chemistry or Mormon quantum mechanics. Universality means for religions that in the whole history of mankind certain kinds of feelings and consideration of transcendence can be traced. However, this universal tendency has been expressed in an enormously great number of different religions. (Perhaps it would be better to use generally the plural of religion, unless an attribute indicates its kind.) Several hundred different religions and religious cults and sects are known. In Hungary at present about 150 different religions are registered, although it is very likely that for many the main motive is to avoid the tax regulations.

Gould's NOMA principle expresses the most important feature of the relation between science and religions. It may be mentioned that this principle is stated in a resolution of the National Academy of Sciences in 1981: "Religion and science are separate and mutually exclusive realms of the human thought whose presentation in the same context leads to misunderstanding of both scientific theory and religious belief." However, the real situation is a little bit more complicated. I suggest to consider the follow Venn diagram:




This clearly indicates that science and the religions belong to two nonoverlapping sets, but there are indirect connections due to other approaches like philosophy, ethics, art, literature, etc. These indirect connections may have very important roles in the process of scientific research, but they cannot distort the progress of science in the long run.

The fundamental difference between the scientific and the religious approaches is not that they give different answers to the same questions, but that they ask different questions from the outset. For example the question, To what end are we on the Earth? is equally important for religious and nonreligious people, but this is not a scientific question.

Genuine faith should be independent of knowledge. Otherwise the faith would not be in fact faith, but rational knowledge, and this would be less valuable from the point of view of religious belief. The example of Thomas illustrates this statement:

> Jesus saith unto him, Thomas, because thou hast seen me, thou hast believed: blessed are they that have not see, and yet have believed. (John 20, 29)

Unfortunately, as far as I can judge it, this diagram refers only to a few religions, mainly the traditional Judaeo-Christian ones, except the fundamentalist approaches even of these religions. For many religions even the opposite is true: they vindicate the right to give answers to definitely scientific questions. As a consequence, they are hostile to institutionalized science. Another interesting aspect is *that some of the pseudosciences are in fact* ersatz religions.

It is worth considering the following matrix:

| | religious | nonreligious |
|---|---|---|
| first class scientist | * | * |
| scientifically uneducated | * | * |

All the four elements of the matrix are of the same rank, therefore it is superfluous, misleading, and irrelevant to stress that any excellent scientist was religious or nonbeliever.

*—Mihály T. Beck*

*(Mihály T. Beck is professor of physical chemistry at the university of Debrecen, Hungary. His book,* Science and Pseudoscience, *in Hungarian, was published in 1977 and 1978. Address: University of Debrecen, P.O. Box 7, 4010 Debrecen 10, Hungary. E-mail: beckmt@tigris.klte.hu.)*

This is a belated response to your science vs. religion issue. I found it to be the most enjoyable issue, cover to cover, I have read. Thanks for presenting it. It was particularly timely, preceding, as it did, the recent actions of the Kansas school board to remove evolution from their educational content. Clearly we have much more of this to look forward to from the religious fundamentalists.

Several of your authors claimed, or at least proposed, that there is a clear demarcation between the domains science and religion, with science having the physical/testable world, and religion having reign in the moral/spiritual/untestable world. I believe that this is good advice to the scientist with religious convictions (pro or con). I also believe that this is the only appropriate editorial position for your magazine.

However, it is only wishful thinking to expect full agreement from the religious community. Certainly, believing in God does not preclude someone from doing good scientific work, nor from being objective in evaluating claims of paranormal phenomena, or other pseudoscientific claims. If it did we wouldn't have made a lot of progress in the past few centuries. I see no reason for your magazine to alienate this significant portion of the population.

Keep up the good work.

Robin McMeeking
Pinckney, Michigan

It goes without saying that the SKEPTICAL INQUIRER's special issue devoted to science and religion was a major success and will help fuel the ongoing debate on the relationship between science and religion in the public domain. Congratulations on a job well done.

In her article "The Science and Religion Movement," Eugenie Scott presents us with the four ways in which science and religion have interacted throughout history. While I do not dispute the logical taxonomy of potential states of interaction, (i.e., the warfare, separate realms, accommodation, and engagement models), I do think it is important to point out that the models are not strictly speaking mutually exclusive. It isn't just that one of the models accurately describes the relationship between science and religion for all time and that we must commit ourselves to one and only one.

Rather, any one of the models may accurately describe the relationship at any given

time or in a particular society, but may over time change. In other words, I believe that the models describe potential states of interaction analogous to a husband and wife who will sometimes get involved in a heated exchange of words, then go about their business in their own separate realms, then begin talking and apologizing, then end up making love! Who could imagine two more unlikely bedfellows?

Milenko Budimir
Parma Heights, Ohio

Re: SKEPTICAL INQUIRER's special issue, on Science and Religion.

You're to be commended on your decision to address these two particular topics in unison. It does not happen nearly often enough, this kind of absolutely open, critical discussion of two, opposing (some may argue that), main mindsets that intellectually help steer human culture. How refreshing to come upon especially this issue of SKEPTICAL INQUIRER.

To express the following is to risk being accused of "religion bashing." I see no way around that risk, so, so be it.

The greatest fundamental flaw of all religions, from which stems the greatest fundamental tragedy, is their intrinsic, ubiquitous, unshakable anthropocentrism. Every religion focuses on the human condition so exclusively you would think no other life-form existed. They never truly take into account probably the most basic tenet about life on Earth that we now know to be true (and know in what *actual* way it is true because of the *findings of science*): and that is that we are all one. That everything started from one primordial microorganism three billion years ago that eventually, exponentially, diversified into all we see today. That the building material and cellular machinery of every living creature is identical, all of us having mutually evolved on this planet by way of Darwinian natural selection over the eons.

In one sense you could say we are all one creature, millions of millennia old: me and my nine-year-old grandson, the wolf-spider lurking under my potato plants, the musk-ox standing guard in the Arctic, the towering cedar trees in my backyard, the manatee submarining in a Florida everglade. Every religious mindset completely ignores this wondrous, most fundamental tenet, having by default convinced billions of believers the world over that humankind is all that ultimately matters, and that all else is here merely to enhance human existence.

Barry Peterson
Nanaimo, British
Columbia, Canada

# LETTERS TO THE EDITOR

## The Millennium Thought Contagion

TEOTWAWKI: it's not just for nuts anymore. Aaron Lynch ("The Millennium Thought Contagion," November/December 1999) nails much of Y2K apocalyptic thinking. It's certainly not surprising to see either the ignorant or the extremely (Christian) faithful growing more and more worried (and worrisome) as the double-ought approaches. Of lesser but still notable concern (also see Lynch) are the numbers of otherwise educated, rational, and not particularly religious folks joining this hysteria.

I began looking at Y2K "bug" hysteria about a year ago, when it was still at the stage where we worried our Mr. Coffees and VCRs might go on the fritz. The nonsense, though, has grown like an accidentally fertilized patch of ragweed, surpassing the merely silly and sprouting into full-leafed tragi-comedy since then, and now dire predictions of utter, irreversible technological failures leading to a social collapse to rival the very worst scenarios for life after global thermonuclear warfare are the norm. And we simply can't lay it all off on the religious nuts. I've encountered a number of people both online and in real life who profess no strong religious feeling, many of whom are or claim to be technically/scientifically literate, who nevertheless sound a heck of a lot like their religious brethren.

I call them the Y2K Hopeful. Unlike religious zealots, they aren't *praying* for the Y2K bug to jump-start the Biblical End Times, but they are certainly *hoping* the bug will disrupt our comfortable civilization. My sense is that this fantasy arises out of these individuals' desire to escape from their cubicled lives and that Y2K technical-failure mythologies offer them the last best hope for some real excitement. . . .

J. M. Schell
Arvada, Colorado

In 1955 a student of mine, a senior in high school, showed me a book that he had brought from home in order to make some point or other about religion. I can't recall what the point was, or the name of the book, but I do remember the gist of a passage from the introduction. It went something like this:

> It was 2000 years from the creation of the world to Moses' receiving the Ten Commandments. It was another 2000 years from the Commandments to the birth of Christ. Will there be another great change in man's relationship to God in the year 2000? Wait and see!

I remember thinking at the time: Good Lord! This is only the mid-fifties. It will be just my luck to still be alive in 2000! So from now on for most of the remainder of my life I'll be hearing codswallop about the millennium. And so will everyone else. And it will get worse as the century goes on!

But I was wrong. The biggest surprise to me concerning this great "non-event" is that there has been so little written and said about the impending Armageddon. I had expected to be inundated with these dire prophecies long before now, but it hasn't happened.

We've had the Jonestown suicides in British Guyana in 1978; the Branch Davidian mess in Waco in 1993; and the [Heaven's Gate] business at Rancho Santa Fe in 1997. Sad as these things are, it seems to me they are dress rehearsals for a show that just ain't going to make it to opening night.

All this leads me to believe that the end of the world is, like newspaper accounts of Mark Twain's early death, greatly exaggerated. If the world is going to go *kerflooie*, I wish it would do it and get it over with, so we can all get about our business.

And in the worlds of the great movie detective, Nick Carter, "If I'm wrong, I'll apologize."

Dave Summers
Holly, Michigan

Two things make me suspicious of memetics: its reliance on quasi-mathematical formulae, arcane terminology, and strained metaphors, and the feverish manner in which its proponents make universal or near-universal claims of its applicability. This is to say, what else is memetics but a pseudoscience?

Ross LaHaye
Green Bay, Wisconsin

## The Star of Bethlehem

Martin Gardner in "The Star of Bethlehem" (November/December 1999) did not mention another famous reference to the "star" that supposedly led the Magi to the place of Jesus' birth, the letter of Ignatius (of Antioch) to the Ephesians. [*The Lost Books of*

*the Bible*, d. William Hone (1820), Bell, New York, 1979.] This letter has a curious reference (IV:10–11) to the time when Ignatius found out about the "star":

> Now the Virginity of Mary, and he who was born of her, was kept in secret from the prince of this world; as was also the death of our Lord: three of the mysteries most spoken of throughout the world, yet done in secret by God.
>
> Now when was our savior manifested to the world? A star shown in heaven beyond all the other stars, and its light was inexpressible, and its novelty struck terror into men's minds. All the rest of the stars, together with the sun and the moon, were the chorus to this star; but that sent out its light exceedingly above all of them.

That this knowledge "was kept in secret" was no doubt why no one had heard about it until a time close to when Ignatius wrote this letter, which was early in the second century. The knowledge of this miracle had either been long suppressed so that "Satan might not learn of it" or just recently invented. This is why Paul and the other apostles were ignorant of it too. The first writing to mention it was the gospel of Matthew published within fifteen years of the end of the first century, well after Paul's last letter. This was followed by the apocryphal "Protoevangelion" or "Book of James" (to which Gardner refers in his footnote) and the first "Infancy," which mention the "star."

In December 1999 Princeton University Press published a book by Mark Kidger, an astrophysicist at El Instituto de Astrofisica de las Canarias in Tenerife, Spain, with the title *The Star of Bethlehem.*

Kenneth H. Bonnell
Los Angeles, California

Discussing the Star of Bethlehem, Martin Gardner appeals for help in locating a source for the tradition that Aeneas was guided from Troy to Rome by a similar star. David Hughes, the British astronomer and advocate of the 7 B.C. conjunction as the origin of Matthew's story, in his *The Star of Bethlehem Mystery* (J.M. Dent, London, 1979) cites Virgil's account of Aeneas' omen as *Aeneid*, II, 692–4, but does not elaborate further. This reference is to part of the hero's escape from the sack of Troy and a call to Jupiter for a sign:

> With a sudden crash came thunder on the left, and a shooting star trailing a firebrand slid from the sky through the dark and darted downwards in brilliant light . . . It left a long luminous streak in its wake, and far around a sulphur-smoke was seen to rise. My father was convinced . . . 'Ah, there is no reluctance now. I follow, Gods of our Race, and where ever you lead, there shall I be.'

(W.F. Jackson Knight's translation for Penguin Classics.) A naturalistic reading of this story, if desired, is clearly possible.

David Barclay
Alton, United Kingdom

Martin Gardner's "The Star of Bethlehem," while otherwise excellent, helps perpetuate the uncritical reading of biblical texts too often encountered when dealing with familiar Bible stories. He rightly observes that only Matthew's gospel contains a reference to the star, but then concatenates Luke with Matthew by stating that the wise men "were guided westward by the Star to the stable where the newborn Jesus lay in a manger."

Matthew in fact knows nothing of stables, mangers, or much else that Luke reports, and Luke is equally innocent of many of Matthew's details. Attention to such matters, while it may seem pedantic, is in fact critical to understanding how the gospel texts came to be and how they reflect the particular aims of their authors.

On another note, the Virgil reference Gardner could not locate is *Aeneid* 2:694. Virgil, it appears, was a better astronomer than Matthew, for Virgil's "star" is in fact a meteor that streaks across the sky: "A sudden crash of thunder, and a shooting star slid down the sky's dark face, drawing a trail of light behind it" (C. Day Lewis translation). This convinced Aeneas' father that it was time to leave Troy and follow the path indicated by the meteor. Since Virgil died in 18 B.C., and Matthew wrote about 85 A.D., it's not impossible that Matthew may have been familiar with this tale either directly or indirectly, and that it may have inspired his own account of the Magi's quest.

Don G. Evans
Randallstown, Maryland

Martin Gardner's informative historical review of various scientific "explanations" for the Star of Bethlehem includes none which could have significantly improved the crude navigation available from solar shadows and the star field. In his Jupiter-Venus example, their merging in mid-June of 2 B.C. was visible over the western horizon for only two hours each evening. Without any means of correcting for the remaining twenty-two hours of crude navigation, this postulated "beacon" would have been essentially useless to the Magi.

A more plausible scientific explanation is that the Magi navigated westward across the trackless desert using the same latitude sailing methods perfected by contemporary Arabian sailors. These pilots sailed fixed-latitude courses with impressive accuracy by merely noting the lower culmination of circumpolar stars that were grazing the northern horizon. Their technique was *simple* because no instruments were needed for the small elevation angles. It was *accurate* because observation errors even as large as a quarter lunar diameter translated into less than ten miles latitude error, regardless of the distance traveled. It was *constant* because the correct latitude was easily regained, even if a sandstorm obscured visibility for several days. And timing was *uncritical* because stellar elevations were "stationary" at culmination.

Latitude navigation, however, could be used only under very restrictive conditions. First, the route must be precisely east-west, such as that followed by the Magi. Second, it required a bright star culminating just above that route's northern horizon, such as Ursa Major's second-magnitude star, Alkaid, then culminating at a two-degree elevation angle. Third, stellar visibility near the horizon required both total darkness and a clear sky, thereby restricting the Magi's journey to between mid-October and mid-February under a cloudless desert sky.

Whenever a star's culmination was invisible, Arabian pilots utilized a higher pair of non-culminating stars from the same constellation in some easily measured configuration, such as equal elevation angles. However, any backup method would degrade navigational accuracy, in part because elevation angles were no longer stationary at the time of measurement.

It seems likely that the Magi were actually guided to Bethlehem by means of a maritime technology unfamiliar to Israel's shepherds and urbanites. The language barrier might have garbled their gratitude at having Alkaid's preferred "stationary" mode available for guidance through the desert.

Arne B. Molander
Montgomery Village, Maryland

*See also the Follow-Up column on page 61 of this issue by Phillips Stevens, Jr.*

*—Editor*

## Debunking the Astrologers

It's only been in the last year or so that I have discovered SKEPTICAL INQUIRER and I can barely wait the two months out until the next issue hits the stands! In the November/

December 1999 issue I especially enjoyed Joe Nickell's pieces on the Shroud of Turin and Fox TV's "Signs from God." These are really very helpful articles. I wish you would do some work on the extreme Pentecostals as Crouch/TBN et al. It could be helpful. Peter Popoff was shown a fraud . . . maybe it's time a few other of the TV "healers" underwent similar investigation. How about it?

"Debunking the Debunkers" was another excellent article, and the line on page 42, "Rather than discuss *informed* critiques of astrology, Vaughan's article only addresses *misinformed* critiques as if the former did not exist," is a classic and genuinely insightful quote! . . .

Lee Niermann
St. Paul, Minnesota

The article "Debunking the Debunkers" by I.W. Kelly in the November/December 1999 issue overlooked a point about astrology that I would have included. Supposedly this institution's ideas about the effect of the planets and signs of the zodiac have been handed down from the ancients throughout history.

Some of the examples cited in the article refer to the influence of Pluto. This planet was discovered in 1930, within the memory of many people alive today. How did astrologers develop the ideas attributed to the effect of ". . . Pluto currently in Sagittarius" or ". . . his Mercury-Pluto conjunction"?

Perry F. Crabill, Jr.
Winchester, Virginia

The next time Valerie Vaughn (the astrologer whose responses to skeptics are debunked in "Debunking the Debunkers") steps aboard a 767 airplane, someone should point out to her that the airliner's designers found research time consuming and expensive, and beyond their reach or expertise because they had no access to funding. They therefore designed the 767 largely by consulting astrology to ascertain each designer's worthiness and ability to design particular components of the aircraft, and trusted astrology's predictions of each designer's degree of infallibility to determine whether the manufactured components would perform satisfactorily.

I'd stake $10,000 that Valerie would, first, disbelieve the claim utterly, and if in the end she were convinced the claim were true, would return her boarding pass and go find a train.

One has to ask the Valerie Vaughns of the world: if astrology is useless for endeavors involving real risk to large numbers of people, what use is it at all? Where does one draw the line between using astrology to divine the answer to a problem and using something else because the burden of responsibility is too great? . . .

Mark Baird
Alameda, California

## Phillip Johnson Is in Contempt of Court

Kendrick Frazier calls Phillip Johnson's mysterious "Chinese paleontologist" a "Deep Throat," using a political metaphor (News and Comment, November/December 1999). I think that it would be better to use a line from Johnson's profession. He stated in his *Darwin on Trial* (Washington, D.C.: Regnery Gateway, 1991, p.8) that "I approach the creation-evolution dispute not as a scientist but as a professor of law . . ." and the dust jacket said that he "looks at the evidence for Darwinistic evolution the way a lawyer would—with a cold dispassionate eye for logic and proof." Let's hold him up to the standard he says he follows.

If Johnson told a jury, "I have a witness that proves the defendant is guilty" and then refused to identify him when the opposing council demanded it, I daresay that the court would not tolerate a "I won't tell who he is in case someone wants to make trouble." This might result in a summary dismissal of charges and/or Johnson being held in contempt of court. I would hope that an attorney pulling that kind of stunt would be disbarred. Phillip Johnson has forever lost the right to flaunt his professional credentials since he is not willing to uphold the standards of his profession.

Charles Darwin, all charges brought against you are dismissed.

Michael S. Hopkins
Norman, Oklahoma

## Carl Sagan's Universe

The reason the public is unable "to distinguish between UFO claptrap and SETI science" ("The Universe and Carl Sagan," p. 31, November/December 1999) is because there really is little difference. SETI is simply a more sophisticated claptrap.

In some ways, UFO backers are the more scientific of the two. They at least have some evidence to (mis)explain. SETI merely has a hope that aliens exist and that they want to tell us something we want to hear. (Some self-important politician sending us a copy of his campaign speeches? Possibly. Scientific formulas or something useful? The alien CIA would surely forbid it.) We might typify SETI fans as people who want their prayers answered by aliens instead of God. That may be equally (in)effective, but it is not scientific.

In both we find a refusal to be discouraged by decades of negative evidence. Always there are "exciting new discoveries," which promise success in another decade, and the broken promises of previous decades are forgotten.

David Carl Argall
La Puente, California

What a surprise to see Velikovsky discussed again in the November/December 1999 SKEPTICAL INQUIRER and by three commentators, no less. Their comments beg for reply.

I would agree with the editor were he to have written that Sagan's critique of Velikovsky in 1974 was a rhetorical tour de force; but I cannot agree that Sagan "had done his homework well" and applied "reasoned argument, celestial mechanics, and the best physical science to counter [Velikovsky's] sensational claims" (p. 4). This is because (1) a large portion of Sagan's "reasoned argument" is against straw men and red herrings, as with the manna after the Exodus, where Sagan criticizes Velikovsky for accepting the biblical account that it did not fall on the Sabbath when Velikovsky explicitly denies this as unrealistic; (2) Sagan's critique contains *no* celestial mechanics since the celebrated great odds against Velikovsky's scenario are derived from "ergodic theory," i.e., ignoring gravitation, as Sagan replied to Dr. Robert W. Bass after his address; and (3) Sagan's physical science is riddled with errors considering, for example, his Jupiter escape velocity is too great (70 versus 60 km/sec, which was corrected for the version in *Broca's Brain*) and the cooling calculation in his Appendix 3 is nothing but a trivial identity: the heat radiated to Venus by the Sun in about one hour at 6000°K equals that radiated from Venus in 3500 years at 79°K. This was reported in my letter in April 1981 *Physics Today* which Sagan ignored at the time and claimed ignorance of it in our final correspondence in April 1996. Interestingly, the letter by S.F. Kogan in September 1980 *Physics Today* showed how Sagan's odds would be drastically reduced if parameters favorable to Velikovsky's intended scenario were used in the calculation. Furthermore,

Sagan's eruption/escape velocity version of the claimed origin of Venus from Jupiter is irrelevant insofar as Velikovsky traded on the planetary fission work of physicists McCrea and Lyttleton in the 1960s; but Sagan ignored this alternative. Many such failings of Sagan's are recounted in Greenberg and Sizemore (eds.), *Velikovsky and Establishment Science* (Glassboro, NJ, 1977).

Martin Gardner (p. 14) refers to the Sun and Moon standing still for Joshua as a result of Earth's rotation ceasing while ignoring Velikovsky's alternative mechanism of axial tilt, as did Sagan in 1974. It is interesting to note that the illusion of a sun-like body standing still can be produced by the close passage of a comet behind Earth.

Finally, Keay Davidson's account (pp. 29–30) of the Sagan-Velikovsky encounter at the AAAS Symposium in 1974 is burdened with inaccuracies, many of which he was warned about in his consultation with me for this section of his biography of Sagan. Thus, for example, he (1) ignores the fissioning model for Venus' origin; (2) perpetuates the coincidence model for the Exodus when Velikovsky is clear that the encounter with "comet" Venus was no coincidence but actually facilitated the escape of the Jews from Egypt; and (3) reports the falsehood that "no other pro-Velikovsky scientist could be found" for the AAAS panel when, in fact, plasma physicist Dr. C.J. Ransom was rejected on the grounds that he was an industrial scientist, not an academic one. On a minor note, there were six speakers, not seven, at the AAAS session: Velikovsky, Michelson, Storer, Huber, Mulholland, and Sagan, and at the time Velikovsky was 78, not 77, years old.

Regarding the fission model for Venus' putative origin from Jupiter, the point is not that it is realistic (for it is not), but that no critic ever addressed its relevance to Velikovsky's scenario and explained why it is not applicable when fission was widely used by Velikovsky in his defense and many supporters took unjustified consolation from this supposed possibility. . . .

C. Leroy Ellenberger
(author of *An Antidote to Velikovskian Delusions*)
St. Louis, Missouri

## Clear Thinking About Cloning

Since the 1997 birth of Dolly, the cloned sheep, I have never ceased to wonder at the near-apocalyptic speculation on the results of human cloning, along with the associated and seemingly unending moral and philosophical debate concerning such an undertaking. Particularly because this intense controversy apparently ignores the obvious fact that human clones have existed within our midst for millennia. Indeed, each of us comes in contact with human clones on an almost daily basis, and there are probably very few readers of SKEPTICAL INQUIRER who are not directly descended from a human clone.

I refer, of course, to the fairly common occurrence of identical twins, who share not only identical nuclear DNA, but also identical mitochondrial DNA, and (in most cases) nearly identical pre-natal and post-natal environments.

Studies of identical twins separated at birth notwithstanding, as the parent of identical twins who have now reached maturity, I have always thought of them as two separate individuals whose differences in both personality and physical development were maybe more striking than their similarities, considering their shared genotype.

In summary, you may replicate genes, but you will never duplicate human beings.

Stephen O. Glenn, DDS
Tulsa, Oklahoma

## Lunar Effect Put to Rest

In "Another lunar effect put to rest," Haven Sweet says the "bottom half of a 22 *mm* bullet casing" was used to dispense lunar soil. I believe he is referring to a .22 *caliber* bullet casing which has an inside diameter of 22/100 of an inch.

James Hesnan
Natick, Massachusetts

This is in regard to the phrase ". . . 22 mm bullet casing. . . ."

This is a meaningless term; there is no such thing as a bullet casing, let alone a 22 mm one. I think what is meant is .22 *caliber* (this equals less than 6 mm—quite a difference!), and specifically .22 Long Rifle (there being many different caliber cartridges). If so, the correct term would be ".22 Long Rifle cartridge case."

As a loyal supporter and original member of CSICOP, I think it is very important that we strive for accuracy in all our writing, to prevent our detractors from using one glaring inaccuracy to cast doubt upon other statements.

W.H. Woodin
President, Woodin Laboratory
Tucson, Arizona

*Haven Sweet replies:*

*I have displayed my underwhelming knowledge of guns and ammunition! Your readers are correct, and I should have described this as a .22 caliber cartridge case, not 22 mm. I believe it would have been classified as a "short," but it was then filed down to a height of 6 mm (yes, this time it is mm) so the volume dispensed would provide the appropriate mass.*

*Given NASA's recent experience with the Mars probe, it is apparent that confusing metric with other units of measurement should not be casually ignored. Thanks to your readers for pointing this out.*

## Extraterrestrial Amino Acids

We need a postscript to the article on the origin of life by Massimo Pigliucci (September/October 1999).

Extraterrestrial amino acids are not always of random chirality. John Cronin of Arizona State University has found a surplus of L amino acids in two meteorites that hit Earth in this century.

In addition, Jeremy Bailey of the Anglo-Australian Observatory has detected circular polarized infrared light coming from a region of intense star birth in the Orion Nebula. There is undoubtedly also ultraviolet light, but this is blocked by the dense interstellar matter. Circularly polarized light can selectively destroy enantiomers, and could produce an excess of the L amino acids. Earth is constantly bombarded by meteorites, which contain all sorts of organic compounds. The slight excess of the L amino acids could have led to the current situation.

Could these compounds have survived the impact with Earth? There was no oxygen, so meteorites and comets might have brought immense amounts of chiral organic compounds. Did it happen? That is another question which needs to be answered before we puzzle out the details of the chemical basis for the origin of life.

R. Thomas Myers
Emeritus Prof. of Chemistry
Kent State University
Kent, Ohio

## A Note on Projective Measures of Personality and Psychopathology

Projective tests, as Scott O. Lilienfeld stated in his article (SI September/October 1999), are controversial because "the evidence for their reliability and validity are weak," but for the believers they are true science. In fact so strong was the belief in the 1950s and 1960s that some were even willing to discard other more ingrained attitudes if their "science" demonstrated such attitudes are wrong. The best illustration of this is the case of attitudes toward homosexuality, namely the 1957 article by psychologist Evelyn Hooker which has come to be regarded as the opening wedge in a major challenge to traditional psychological and psychiatric attitudes toward homosexuality.

Hooker conducted a study of personality structure and psychological adjustment of thirty male homosexuals and compared them with thirty male heterosexuals who were matched for age, education, and I.Q. The mean age for the homosexuals was 34.5 and for the heterosexuals, 36.6, with th age range for both groups between 25 to 50. The mean I.Q. for the homosexual sample was 115.4 and for the heterosexuals 116.2, with both groups falling between 90 to 125. The mean education for the homosexuals was 13.9 years and for the heterosexuals 14.3. None of the homosexual subjects were in therapy, and only three of them had had any heterosexual experience. All but three of the heterosexuals had been exclusively heterosexual beyond adolescence, and none had extensive homosexual experience. None of them were in therapy. On the Kinsey scale of 0 (exclusively heterosexual) to 6 (exclusively homosexual), the homosexuals were rated 6 while the heterosexuals were rated 0.

After securing her sample, Hooker proceeded to test her subjects with a variety of projective scales including Rorshach protocols, Thematic Apperception Tests and Make a Picture Story responses. Two judges independently reviewed the results and attempted to place the anonymous subjects' adjustment on a five-point rating scale. Each attempted to distinguish the homosexuals from the heterosexuals. The judges did not differ significantly in their ratings, and could not, contrary to psychological theory of the time, distinguish homosexuals from heterosexuals (Hooker 1957).

The study proved to be the opening wedge into discrediting traditional views of homosexuality as a pathology and to emphasize there was no necessary relation between heterosexual sexual orientation and other aspects of a person's intrapsychic or interpersonal functioning. Believing their measures were valid, and other projective tests taken later by others tended to agree with Hooker's results, the "scientists" were willing to challenge long-held traditional belief about homosexuality.

The other alternative was to challenge their assumptions about projective testing, and to do so would undermine their belief in psychology as a science. Although we now may challenge the reliability of the projective tests, it was unthinkable to do so by the believers in the 1950s. Hooker was acclaimed for her findings, given all sorts of awards, and eventually headed up a national task force on homosexuality which was instrumental in challenging old biases. Such was the power of what Lilienfeld called a pseudoscience, when believers are convinced they have the truth.

Vern L. Bullough
Westlake Village, California

## Thesis on Science and Pseudoscience

I have the pleasure of informing you that on November 12 I received my degree in Journalism, *cum laude*, from the Universidad Católica Andrés Bello (Andrés Bello Catholic University, here in Caracas).

You may ask, Why would we want to know about your degree?

My graduate thesis was named (in *English translation*) "*Science, Pseudoscience*, and Antiscience: How the Media Collaborates with the Public's Disinformation." It won a "Recommendation for Publication." The reference list includes twenty-seven items from the SKEPTICAL INQUIRER magazine and two items from *Free Inquiry*, as well as several book citations of CSICOP personalities such as Mario Bunge, James Randi, and the late Carl Sagan.

As far as I know, this was the first skeptical-oriented college thesis in Venezuela. CSICOP publications were fundamental in my success, and I sincerely thank you all.

Sami Rozenbaum.
Caracas, Venezuela

## 'Linear' Thought?

The distinction drawn by Jo Schaper in her letter (November/December 1999) between "linear" thought and some other kind is puzzling. I know what linear and nonlinear equations are, but am baffled by the application of these terms to the thinking of scientists in general. The nearest she comes to an explanation is to describe linear thinking as reliance upon deductive logic in the style of Sherlock Holmes. Although Holmes was described by Arthur Conan Doyle as practicing the science of deduction, his method was inductive. He examined his data, formed some tentative hypotheses, checked them by further observation or experiment, and retained the one that best fitted the facts. This is standard procedure for scientists, but Ms. Schaper appears to believe that they regard it as inferior to some other method because it is "nonlinear."

Among the female scientists and mathematicians who won and deserved the respect of their male associates were Sophie Germain, Marie Curie, Emmy Noether, Lise Meitner, and Julia Robinson. It is not hard to imagine their probable reaction if they had been reproved for thinking in a "masculine" way instead of relying upon their more fruitful women's intuition.

David A. Shotwell
Alpine, Texas

## Drinking Urine at Sea

Having just read Nordhoff and Hall's *Men Against the Sea*, as well as Bligh's own account of his voyage, I beg to differ with the assertion in Brad Goldberg's letter (September/October 1999, p. 69) that Captain Bligh's followers drank their own urine and died. Only one man died on the trip, stoned to death by hostile islanders, and if anyone drank urine, nobody seems to have recorded it . . . .

The problem is that if there is no water to drink, there's very little urine that you can pass.

Thomas D. Fuller
Springfield, Virginia □

The letters column is a forum for views on matters raised in previous issues. Letters should be no more than 225 words. Due to the volume of letters not all can be published. Address letters to Letters to the Editor, SKEPTICAL INQUIRER. Send by mail (preferred) to 944 Deer Dr. NE, Albuquerque, NM 87122; by fax to 505-828-2080; or by e-mail to letters@csicop.org (include name and address).

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AT THE CENTER FOR INQUIRY–INTERNATIONAL (ADJACENT TO THE STATE UNIVERSITY OF NEW YORK AT BUFFALO)

**AN INTERNATIONAL ORGANIZATION**

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**David E. Thomas,** physicist, mathematician, Peralta, New Mexico
**Sarah G. Thomason,** professor of linguistics, University of Pittsburgh
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# Center for Inquiry–International

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## THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

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The Committee for the Scientific Investigation of Claims of the Paranormal encourages the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and disseminates factual information about the results of such inquiries to the scientific community, the media, and the public. It also promotes science and scientific inquiry, critical thinking, science education, and the use of reason in examining important issues. To carry out these objectives the Committee:

- Sponsors publications
- Conducts public outreach efforts
- Maintains an international network of people and groups interested in critically examining paranormal, fringe-science, and other claims, and in contributing to consumer education
- Encourages research by objective and impartial inquiry in areas where it is needed
- Convenes conferences and meetings
- Conducts educational programs at all age levels
- Does not reject claims on a priori grounds, antecedent to inquiry, but examines them objectively and carefully

The Committee is a nonprofit scientific and educational organization.
The SKEPTICAL INQUIRER is its official journal.

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